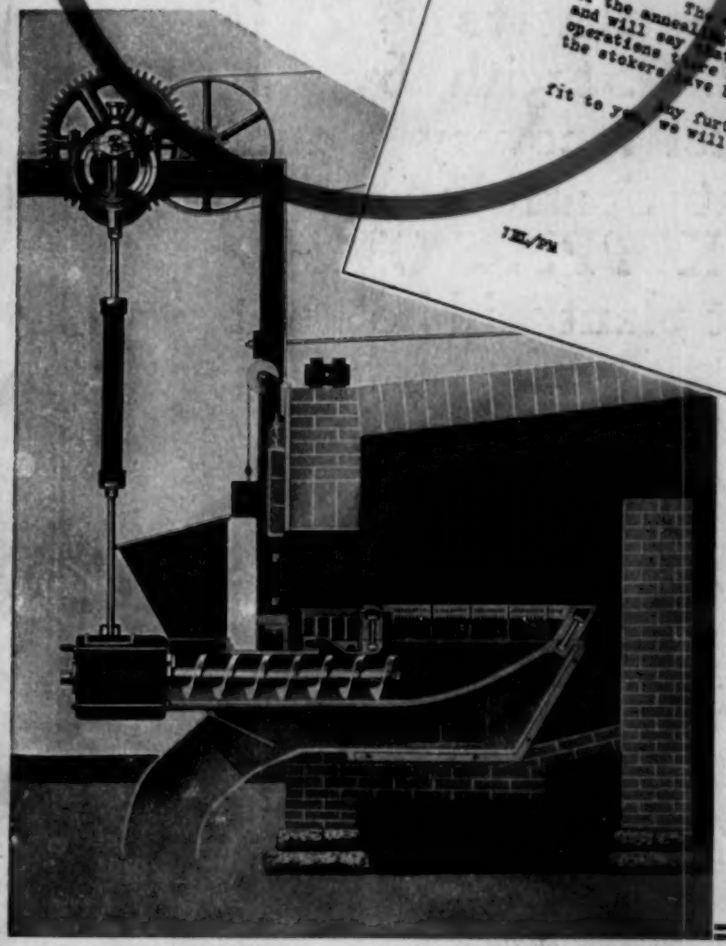
THE IRON TRADE REVIEW

Single Copies 15 Cents — CLEVELAND, SEPTEMBER 28, 1916 — Four Dollars a Year

"We can say that [illegible] fired sheet, pair and annealing furnaces are in every way preferable to producer fired furnaces."

Hundreds of Plants in which are installed more than 3800 of our stokers, all echo the same sentiments.

We have received repeat orders from every customer we have. A few concerns have close to one-hundred (100) installations. One concern has one-hundred and sixty-four (164) of our stokers.



McKEESPORT TIN PLATE COMPANY

GENERAL OFFICE AND WORKS, McKEESPORT, PA.

McKEESPORT, Pa., Jan. 26th, 1915.

Geo. J. Hagan Co.,

Pittsburgh, Pa.

Gentlemen:-

We are in receipt of your favor of the 19th inst. and regret that same was not replied to before this, but as the writer was out of the city the matter was deferred until his return. He is awful sorry and hopes that even now it may be of some benefit to you.

We can say that the stoker fired sheet, pair and annealing furnaces are in every way preferable to producer fired furnaces; saving in cost of maintenance, labor and saving in fuel is very much less than cost on Gas producer furnaces. We can assure you that at any time we may install annealing furnaces that we will certainly use the stoker.

The writer is very familiar with the operations of the annealing furnaces of the Washington Tin Plate Co. and will say that he has kept in very close touch with the operations there and has been advised also by Mr. Hanna that the stokers have been very successful.

fit to you any further information that would be of any bene- we will be very glad to furnish you.

Yours very truly,

JEL/PH

McKEESPORT TIN PLATE COMPANY.

General Manager.

UNDERFEED STOKER FIRED FURNACES

make coal a more efficient and cheaper fuel than either natural gas or fuel oil.

The stokers eliminate scaling and smoke, and give an even, controllable heat.

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GEORGE J. HAGAN CO.

401 Peoples Bank Building, Pittsburgh, Pa.

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KOPPERS OVENS

THE BETHLEHEM STEEL COMPANY has awarded to H. KOPPERS COMPANY, Pittsburgh, Pa., two contracts for by-product coke plants. 240 KOPPERS OVENS with by-product and benzol recovery plants will be built at Sparrows Point, Maryland. 60 KOPPERS OVENS with by-product plant will be built at Steelton, Pa.

THE STANDARD OF THE WORLD

Say you saw it in THE IRON TRADE REVIEW

THE IRON TRADE REVIEW

Vol. LIX Cleveland, September 28, 1916 No. 13

Heavy Pig Iron Buying Continues

Lukens Iron & Steel Co. Takes Large Tonnage—Many Inquiries Pending—Oil Line Project Will Require 60,000 Tons of Steel Pipe

HEAVY buying of pig iron, especially of steel-making grades, continues and the trend of prices is upward. In the Philadelphia district, the tonnage purchased amounted to fully 100,000 of various grades, including 56,000 tons of basic by the Lukens Iron & Steel Co., of which 46,000 tons were taken by eastern Pennsylvania makers at $20, delivered, and the remainder by Alabama companies at about $19.75, delivered. The Trumbull Steel Co., Warren, O., is in the market for 36,000 tons of basic for its new plant, the Newport Rolling Mill Co. is inquiring for 10,000 to 12,000 tons, and the Republic Iron & Steel Co. is figuring on 15,000 tons. The price of bessemer is now established at $22, valley, with No. 2 foundry being freely sold at $19, valley, while basic is held at $19, which apparently is the lowest price obtainable. Many orders for foundry irons have also been placed, including 10,000 tons by the National Radiator Co., for its plants at Johnstown, Pa., and Trenton, N. J., and 6,000 tons by the American Stove Co., for its plant at Bedford, O. The Cleveland market is very strong with one furnace company temporarily withdrawn from the market.

The Italian government has again entered the market for shell steel and is inquiring for 40,000 5-inch rounds or squares for as early delivery as the mills can make.

Pipe

A pipe line of 800 miles to be laid from the Tulsa, Okla., oil fields to Chicago, will require about 60,000 tons of pipe, and inquiries for this tonnage are now pending. This is one of the most important enterprises of its kind ever undertaken.

Plates

The Argentine government is understood to be figuring on having 10 merchant vessels built in this country at a cost of about $25,000,000. Pending the awarding of contracts by the government in carrying out its naval program, there has been some holding back on merchant vessels, but it is expected that as soon as the government is protected, contracts for many more ships will be awarded. Buyers of plates other than ship builders are active, including leading locomotive, car and boiler manufacturers, who have opened negotiations for contracts for large tonnages. One buyer has placed 12,000 tons, and another 2,500 tons for first quarter of next year at 4c, Pittsburgh.

Shapes

Leading manufacturers have advanced quotations on structural shapes to 2.70c, Pittsburgh, for delivery at convenience of the mill, but for anything approaching prompt delivery, higher prices are asked. In the eastern district, labor conditions are a factor of considerable importance in the structural material market.

Semi-Finished Material

The scarcity of semi-finished material is a very serious matter, especially to consumers who have not well-established sources of supply. While some contracts for sheet bars for the last quarter of the year recently have been adjusted on a basis of $40, the minimum quotation is now $45 and many contracts are being adjusted on that basis, while in some cases even higher prices prevail. A year ago, sheet bars were selling at about $25.

Iron Ore and Coke

The scarcity of laborers in the coke regions is causing considerable embarrassment, and deliveries, especially to foundries, are slow and uncertain. A sale of 15,000 tons of old range non-bessemer ore has been made to an eastern consumer for delivery this year at an advance of 25 cents and a tonnage of bessemer ore has been offered at an advance of 40 cents.

Railroad Buying

Railroads, particularly in western territory, are making an unusual effort to place orders for rolling stock. Inquiries include 1,000 box cars for the Pere Marquette, 1,000 hoppers for the Chesapeake & Ohio, and 2,000 general service cars for the Missouri-Pacific.

THE OPEN HEARTH

Mr. Sheadle's Service to the Men of the Great Lakes

JASPER HOLMES SHEADLE became connected with the iron business in 1888, and in that entire season the lake shipments amounted to only 5,063,877 tons. In the month before his death, the shipments amounted to 9,850,140 tons and the outlook is that this season's movement will be twelve times that of 1888. With this wonderful increase in tonnage moved came mechanical and financial problems which were solved by great engineers and men of business, but of no less importance was the human problem and with the progress which has been attained in its solution the name of Sheadle will be forever associated.

"Modern business is combining the making of money with the performance of service to others," said Mr. Sheadle, in his report as chairman of the welfare committee of the Lake Carriers' Association at the annual meeting of 1915. And in the same report, he said, "The conservation of the health of men is the most important one thing that can enlist the attention of the employer, and the more successful the employer is in safeguarding the health of the employe, the greater the efficiency of his organization. The natural tendency of men is in the direction of better things, and all that is often needed to start them on the right course is to point out the way."

The above expressions were typical of the thoughts that were ever uppermost in Mr. Sheadle's mind, but his report to the meeting of 1916 was to even a greater extent an expression of the reasons lying at the foundation of welfare work.

In that report, Mr. Sheadle made this broad statement:

"The human element is the most important feature in the consideration of the relations between the employer and the employed. No enterprise in industrial life can ever make for substantial success for any considerable period that does not take full cognizance of the personal element."

Then he spoke of the development of the industry from the days when the personal acquaintance of the employer and the employe was a safeguard against serious misunderstanding to the present time when there is danger of the employe being but a cog in the great industrial machine. He dwelt upon the necessity of employers doing all in their power to promote the happiness of their employes and reviewed progress that had been made along different lines. For example, comparing the years 1913 and 1915, accidents due to carelessness had decreased from 246 to 134. Much had been accomplished in promoting sanitation; the assembly rooms had become a "real harbor of refuge for the seamen"; but the success of the savings plan was the result that brought Mr. Sheadle the greatest joy. "There is," he said, "a gulf as wide as the sea between the man who has money in hand and the man who is strapped. One takes a courageous front view of life because of independence, while the other takes the discouraged view of one beaten." He pointed with justifiable pride to the fact that the savings plan on the lakes has attracted attention throughout the country and is being introduced in other industries. Since the plan was adopted, 9,000 accounts have been opened and $1,500,000 have been deposited. The fact that the present amount of savings on deposit is only about $400,000 does not indicate that withdrawals prove improvidence. On the contrary, the sailors, through the Sheadle plan, have learned to save their money and also to spend it wisely as never before. Their greater happiness is an immeasureable but an imperishable monument to his memory.

Greater Elasticity Needed

AT the third annual meeting of the National Foreign Trade Council held in New York last week, the tariff question was considered in a broad and sane way. President James A. Farrell, of the United States Steel Corporation, in his annual address as chairman of the council, painted a striking picture of opportunity and of commercial strength for the United States at the end of the present European war and declared that there must be real statesmanship to safeguard the interests of the United States. Mr. Farrell referred to the European economic alliances, which were foreseen and discussed at the council's last meeting and to the fact that these alliances have since been concluded. He added that the present prospect is that when peace settles upon Europe, there will remain two commercial groups, the members of each undertaking a system of mutual trade preferences which may automatically create discrimination against neutrals. He predicted that the United States will be both the largest customer and the most formidable competitor of Europe and will hold a powerful position, if properly safeguarded.

The council, by resolution, called attention of the President, congress and the tariff commission, created by recent enactment, to the necessity of tariff legislation along broad lines, so that "the tariff system, whatever be its underlying principles, shall possess adequate resources for the encouragement of foreign trade by commercial treaties or agreements, within defined

THE OPEN HEARTH

limits, and its protection from undue discrimination in the markets of the world."

Willard Straight, vice president of the American International Corporation, in presenting the report of the committee on tariff matters, urged the necessity for a greater elasticity than that now obtaining in the American tariff system regardless of whether the tariff is maintained for protection or revenue or partially for each. "It is obvious," he said, "that the United States should have some manner of adjusting its tariff to new conditions created by political or commercial changes on the part of our competitors and customers without resorting to a general revision."

We believe that the position taken by the council is a very wise one. Certain it is, as Mr. Farrell indicated, the United States must be a buyer as well as a seller after the war ends. We cannot, as McKinley said in his last great speech at Buffalo, "live unto ourselves". How, then, can we trade on a fair basis to ourselves and to all the world? No man today can say. No one can safely predict what conditions will be after the restoration of peace, but it is certain that all the leading nations will be engaged in a struggle to get their share of the world's commerce and it will be highly important to have a tariff system that can be easily and quickly adjusted to meet new conditions. If the usual slow process of making a tariff law were followed by the United States congress after the war, great harm might be done before the bill could be enacted. Probably the best plan would be to fix certain maximum and minimum tariff rates and vest in the President the power to fix the exact rates in all cases.

Twenty Per Cent Efficiency

WHAT would become of any private business operated at 20 per cent efficiency? Of course it would wind up in bankruptcy court. What, then, should happen to a city government operated at such a small rate of efficiency? Certainly it needs shaking up.

At the recent meeting of the Chicago chapter of the American Association of Engineers, Alderman Charles E. Merriam delivered an address on city government in Chicago, speaking particularly on engineering subjects which came to his attention on the council committees. He declared that for the engineer not to take part in political affairs is high treason and he stated that, "the department of public service is made up largely of engineering positions and that it has had some good men and still has some good men, but it is operated at only about 15 or 20 per cent efficiency." Although everybody knows that public service is not as efficient as it ought to be, Mr. Merriam's statement is astonishing.

In order to give the government the shaking up that it needs, the facts must be made known by such people as Mr. Merriam and a campaign of education must be carried on. Along this line, it is pleasant to note that the engineers' subdivision of the Chicago Association of Commerce is offering prizes for the three best papers, not to exceed 3,000 words, on any one of the following subjects: "Engineering and Civic Progress", "The Engineer of the Future", "The Business Relation of the Engineer to the Commercial World". The contest is open to undergraduates and graduates of any recognized school of engineering in the United States, up to Nov. 1 of this year. Suggested topics for development are: Relationship of the engineer and of engineering to the business and professional world; how best to realize the conceived ideal of engineering, concrete examples illustrative of the true significance of engineering, such as a brief prospectus of a proposed work or a short, crisp, readable news article on a piece of engineering construction. If the older men cannot be stirred up, doubtless much may be accomplished by arousing the younger men to a keener appreciation of civic duties.

Women Workers

FOR a time after the extensive employment of women was inaugurated in England, on account of the scarcity of men, the results of the substitution of women for men were highly encouraging, but our correspondent at Birmingham, Eng., informs us that complaints of "slacking" in Sheffield shell works have been rather frequent lately and the blame for this has been cast on the women workers. Complaints have been made before the munitions tribunal and one firm lately produced evidence to show that there was a decrease of 25 per cent in the output of shells. It was said that the women lose time staying at home for whole days when they should have been at work. This seems, after further investigation, to have been an extreme case, but it is now being recognized as absurd to expect as much strenuous work from women as from the men they have replaced. The more considerate employers state that the extensive Sunday work is to blame and they believe that if it were abolished there would be better work done, with no diminution of output. The women are entitled to great credit for what they have done, but it is probable that when the war ends most of them will return to the work for which they are best fitted.

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago.)

Quotations on leading products September 27, average for August, 1916, average for June, 1916, and average for September, 1915. Prices are those ruling in the largest percentage of sales at the dates named.

	Prices Sept. 27, 1916.	Aver. for Aug., 1916.	Average for June, 1916.	Aver. for Sept., 1915.
Bessemer pig iron, Pittsburgh	$22.95	$21.95	$21.95	$16.80
Basic pig iron, Pittsburgh	19.45	18.95	18.95	15.65
No. 2 Fdy. pig iron, Pittsburgh	19.70	19.45	19.45	15.45
Northern No. 2 Fdy., Chgo.	18.50	19.00	19.00	13.80
Lake Superior Charcoal, Chgo.	19.75	19.75	19.75	15.95
Malleable, Chgo.	19.00	19.50	19.50	14.20
Southern No. 2, Birmingham	14.50	13.75	14.15	11.30
Southern Ohio No. 2, Ironton	18.00	18.50	18.46	14.20
Basic, eastern Pa.	20.00	19.25	19.25	15.25
No. 2X Virginia furnace	18.50	18.50	18.00	13.25
No. 2X foundry, Philadelphia	20.75	19.85	20.00	16.00
Ferro mang., Balti.	164.00	170.00	175.00	110.00
Bessemer billets, Pbgh.	45.00	43.60	41.20	24.60
Bess. sheet bars, Pbgh.	45.00	43.60	41.20	24.60
Op.-h'th sh. bars, Pbgh.	45.00	43.60	41.20	25.80
Open-hearth billets, Pbgh.	45.00	43.60	41.20	25.60
Steel bars, Chgo.	3.10	2.77	2.69	1.54
Steel bars, Pittsburgh, contr.	2.60	2.50	2.50	1.34
Iron bars, Philadelphia	2.659	2.559	2.559	1.40
Iron bars, Cleveland, local del'y.	2.55	2.40	2.40	1.35
Iron bars, Chgo. mill	$2.35	$2.35	$2.35	$1.31
Beams, Chgo.	3.10	2.77	2.69	1.54
Beams, Pittsburgh, contr.	2.60	2.50	2.50	1.34
Beams, Philadelphia	2.759	2.699	2.659	1.509
Tank plates, Pbgh., contract	3.00	2.90	2.75	1.32
Tank plates, Chicago	3.50	3.77	3.09	1.49
Tank plates, Philadelphia	3.909	3.909	3.909	1.509
Sheets, blk., No. 28, Pbgh.	3.00	2.75	2.92	1.92
Sheets, blue an., No. 10, Pbgh.	2.90	3.00	3.10	1.52
Sheets, galv., No. 28, Pbgh.	4.25	4.25	4.79	3.67
Wire nails, Pittsburgh	2.60	2.58	2.50	1.69
Connellsville fur. coke, contr.	2.50	2.40	2.63	1.84
Connellsville fdy. coke, contr.	3.25	3.15	3.50	2.37
Heavy melting steel, Pbgh.	16.50	16.00	16.25	14.25
Heavy melting steel, east'n Pa.	15.00	15.00	15.75	15.00
Heavy melting steel, Chgo.	16.00	14.50	15.35	12.00
No. 1 wrought eastern Pa.	20.00	19.90	20.75	16.00
No. 1 wrought, Chgo.	17.00	15.40	15.35	10.75
Rerolling rails, Chgo.	17.75	15.70	16.25	13.15
Car wheels, Chgo.	12.00	11.90	12.50	11.75

(For Additional Prices See Page 662.)

Large Tonnages of Pig Iron Bought

Business in Philadelphia Territory Amounts to Fully 100,000 Tons—Round Lots Pending and Placed in the Pittsburgh District and Prices Are Higher at Leading Centers

Philadelphia, Sept. 26.—Heavy buying by various consumers, principally in basic and low phosphorus grades, has made the total turnover of pig iron in this territory during the past week not less than 100,000 tons. The largest single transaction was the purchase of 56,000 tons of basic for first half by the Lukens Iron & Steel Co., of which 40,000 tons went to eastern Pennsylvania makers at $20, delivered. The remainder is understood to have been taken by Alabama furnaces, probably at $15, Birmingham, or $19.75, delivered. A Phoenixville, Pa., consumer also is credited with having purchased 3,000 tons of basic for next year from Alabama. A Perth Amboy steel plant closed for 3,000 tons of eastern Pennsylvania basic for next year at $20.25, delivered. Active buying of low phosphorus iron for all next year continues and a leading eastern maker in the week closed 15,000 to 20,000 tons additional, part of which is for export. This maker now has booked from 25,000 to 30,000 tons in orders for next year and has advanced his price $1 to $35 to $36, Philadelphia. Other eastern producers are expected to do likewise. Some large new inquiries for foundry iron have appeared, including 4,000 to 6,000 tons of No. 2X and 1,000 tons of No. 2 plain, shipment to begin in November, for the Baldwin Locomotive Works; 5,000 tons of two grades for next year for the National Products Co. for Trenton and Johnstown; 1,200 tons for a Baltimore soil pipe works; 1,000 tons for the Lenoir City, Tenn., car works; 300 tons of car wheel iron for the Pennsylvania railroad; and several thousand tons of standard forge for an eastern Pennsylvania buyer. Pipe shops along the Delaware river continue to buy more freely. One of them this week closed for 3,000 to 4,000 tons of early delivery Alabama iron at $14, Birmingham, for No. 3, or $18.20, delivered. Another took 1,500 tons of Alabama offcasts. Some very low prices on inferior grades of southern iron are being named to the pipemakers. Eastern Pennsylvania foundry prices still show irregularity. One producer who was short on this grade bought 2,000 tons or more of No. 2X for nearby delivery from another maker at $18.50, furnace. Usually the furnace men want from $19.25 to $19.50, furnace. Virginia iron continues to sell freely at $17.50, furnace for No. 2X. One producer has sold upward of 20,000 tons since Sept. 1.

Some Sharp Advances

Pittsburgh, Sept. 26.—The pig iron market, after a delay of several months, has started on its way toward higher levels, and some grades, notably bessemer and foundry, have registered sharp advances. Bessemer pig iron, offered at $21, valley, 10 days ago, has since sold at as high as $22 and even $22.50 a ton. No. 2 foundry has sold freely at $19 and a carload for prompt delivery has commanded as high as $20 a ton at the furnace. Basic pig iron reflects strength and is being held at $19, valley, by most concerns. The National Malleable Casting Co. has closed for its basic pig iron requirements at Sharon, Pa., for the first six months of 1917, taking about 2,500 tons per month on a sliding scale basis. The Trumbull Steel Co., Warren, O., which last week announced plans for the erection of an open hearth steel plant; has entered the market for 36,000 tons of basic pig iron. Extension plans of the Trumbull company were outlined on page 559 of the Sept. 21 issue of *The Iron Trade Review*. The Republic Iron & Steel Co., Youngstown, has been negotiating for 15,000 tons of basic iron and sev-

(*For complete prices see page 662.*)

eral other prominent consumers are negotiating for requirements.

Last week, the Valley Mold & Iron Co., Sharpsville, Pa., concluded negotiations with the Claire Furnace Co., that city, for 27,000 tons of bessemer iron, which will be shipped after Oct. 1 direct from the furnace to the ingot mold plant. The Valley Mold & Iron Co. now is receiving about 950 tons of molten bessemer iron a day from the Shenango Furnace Co., Sharpsville, Pa. A West Virginia consumer has taken 2,000 tons of bessemer and the Colonial Steel Co., Pittsburgh, last week closed for a similar tonnage. The Mesta Machine Co., Pittsburgh, is in the market for about 3,000 tons. The National Radiator Co., Johnstown, Pa., has taken about 10,000 tons of foundry iron for plants at that city and Trenton, N. J. A car manufacturer has closed for 2,000 tons of malleable and several other consumers of malleable iron have purchased lots ranging from 500 to 3,000 tons. Both No. 2 foundry and malleable iron have been sold at $19, valley, for shipment the first half of next year.

Labor Condition a Factor

New York, Sept. 26.—A tapering off in the amount of new domestic business coming into the pig iron market in this district has continued throughout the past week. Sales usually have been small and miscellaneous. Consumption of the foundries still clearly is being affected by the lack of workmen and former purchases will be sufficient to carry numerous plants to a more distant date than they had anticipated. Labor shortages are pronounced among some of the New England shops, especially in the Bridgeport district. Prices are holding their own and the trend is upward in a gradual and irregular way. Tidewater No. 2X today is not under $20. A prominent eastern Pennsylvania maker has boosted his schedule to $20, furnace, for No. 2X, and will not sell beyond the first quarter. The 3,000 tons of basic for a Perth Amboy buyer has been satisfied and a Phillipsburg, N. J., pipemaker bought 2,000 tons of two grades from nearby furnaces. The American Locomotive Co., which remained in the market for 2,500 tons, has decided not to buy at present. A 2,000-ton Elizabethport inquiry still is open. Export inquiries are numerous, though sales this week have been of smaller total. Foreign buyers continue to authorize their agents on this side to buy foundry, hematite and other grades at the best prices offered and are not following the usual method of dealing by offers and counter-offers. A new inquiry calls for 2,000 tons of Alabama foundry and an indefinite tonnage of hematite for delivery at French ports. Italy asks 1,500 tons of special malleable. Some thousands of tons are represented by other pending inquiries. Reports of lower bessemer prices for export continue. Some buyers claim they have been able to do less than $21.75, New York, for standard bessemer and 50 cents higher for high silicon bessemer. The abolition of export rail rates on pig iron Oct. 1, when domestic rates will apply, will mean an advance from the valleys to New York of $2.14 to $2.98; to Philadelphia from $1.94 to $2.78, and to Baltimore from $1.84 to $2.68. An export inquiry for 3,000 tons of foundry coke is pending.

Extremely Active.

Cleveland, Sept. 26.—The pig iron market is extremely active not only in the immediate Cleveland district, but also in the larger territory in which Cleveland firms sell their iron. In the city of Cleveland, buying has been largely by foundries in lots of from 500 to 1,000 tons for delivery in the first half of next year. The American Stove Co. has purchased 6,000 tons for its plant at Bedford, O., at about $19, delivered, for first half of next year. The Cleveland Furnace Co. has withdrawn from the market temporarily and $19, furnace, apparently is the minimum quotation on No. 2 foundry or malleable. The scarcity of basic is pronounced. There is almost none available from furnaces for delivery before Jan. 1, and some furnaces have very little to sell prior to July 1.

A number of sales of ferro-manganese have been made to steel companies in Cleveland and other points in northern Ohio, aggregating about 1,800 tons, for delivery the last quarter of this year and the first half of next year. The alloy is to be shipped from Chicago by the Miami Products Co., at $165, delivered. Steel companies which have used the product of the Chicago company have found it highly satisfactory, some preferring it to the English make.

Chicago Sales Heavy

Chicago, Sept. 26.—Large demand and continuously heavy sales of most grades of pig iron mark the situation in Chicago. The selling is practically all for first half delivery and all melters seem anxious to cover their requirements for the early part of next year. Occasional sales are made for prompt delivery, but this does not amount to much. Labor conditions and the unusual heat of the summer caused a diminution in the melt and has left a larger supply of pig iron in most foundry yards than had been expected and many melters find they will have sufficient to carry them until the first of the year. Some observers in close touch with the situation assume that practically half the production in this district for first half already has been placed under contract and at the present rate of inquiry and buying the remainder will be sold before many weeks have passed.

Prices remain unchanged with northern No. 2 foundry at $18.50, Chicago furnace, and malleable at $19, furnace. Charcoal iron is being taken in large tonnages at the quotations which have prevailed for several months. This grade of iron in competition with malleable is one factor in holding the malleable market at its present level.

The situation in southern iron is strengthening steadily and some southern makers appear to be sold fully for the remainder of this year and some have sold four or five months' output in next year. Most of the larger makers are refusing all offers under $15, Birmingham, for first half, but some will take contracts for fourth quarter at $14.50, Birmingham. Warrants for southern iron are understood to be selling at $14.25, Birmingham. Rumors are heard from time to time of these quotations being shaded, but these are attributed to the appearance of resale iron.

A good demand for iron for export continues and the only bar to large sales is inability to obtain ocean vessel space. This demand is coming not only from the European countries at war, but also from South America and the Orient, as the usual supply of iron has failed and they are turning to the United States for help. A feature of the export inquiry is that recently malleable iron has been asked as well as bessemer and foundry and now practically all grades made in this country are figuring in the export market.

Prices Stiffen

Buffalo, Sept. 26.—Melters in the past few days have come into the Buffalo market with inquiries for an aggregate of over 25,000 tons of foundry, malleable and special grades of iron for delivery largely through first quarter of 1917. The sales for the week, however, amount to not over 12,000 tons, as the furnaces are sold up to such an extent that it is difficult to have the producers book even small tonnages for customers of long standing. With this situation apparent, several of the furnace interests have advanced their absolute minimum for any grade to $19.50. While the price schedule continues at $19 to $20, the maximum more nearly represents the market. Some sales have been made at $19.75 and a quotation of $20 on a round tonnage is liable to be with-

(For complete prices see page 662.)

drawn on short notice, it is reported.

The demand for foundry and malleable grades is stronger at the present time than it is for the steelmaking irons. Furnaces are being pressed to the limit of their capacity to get out iron under contract.

Heavy Buying Continues

Birmingham, Ala., Sept. 25.—Continued activity has marked the pig iron situation in the Birmingham district and the total sales the past week have exceeded those of any week for some time past. Twenty-eight thousand to thirty thousand tons were sold for this year's delivery and for shipment through the first half of 1917. A canvass of the situation has developed the fact that some concessions have been made in prices. That is, for good round lots for the rest of this year, $14 per ton at the furnace obtained, while for 1917 delivery $14.50 to $15 prices were received by sellers. Four thousand tons of export iron were booked for Italy, Norway and Holland. From 15,000 to 20,000 tons more of standard iron was offered the interests of the district for export delivery, but on account of limited time for shipment, and $13.50 price to be met, practically all the tonnage was declined. The bulk of iron that has been booked for export delivery so far has consisted of special analysis iron, for which full market prices were obtained. Many of the southern buyers who have not fully covered themselves for all of their 1916 requirements have come in the market, but all have not yet been taken care of, and some probably will not be able to cover their needs by reason of sellers having already practically sold their anticipated make for the year.

Buying Satisfactory

Cincinnati, Sept. 25.—Buying of pig iron in this market is satisfactory. The L. Schreiber & Sons Co., this city, has purchased 800 tons of northern foundry iron for delivery extending into the first half of next year, and Leary & Manly, also a local concern, have taken 1,200 tons, divided between several grades of iron. Other sales include 1,000 tons of Virginia iron in Indiana, 1,200 tons of silvery iron in Michigan, 500 tons of charcoal iron in central Ohio, and 1,000 tons of northern foundry iron to a melter in the same locality.

The price of southern Ohio No. 2 foundry iron has been advanced to $18.50 to $19, Ironton basis, for first half shipment. Last week this grade was selling at $18.

One Tennessee stack is offering southern No. 2 foundry at $14, Birmingham basis, for prompt delivery, but is holding at $14.50, for the first half of next year. Alabama stacks are asking from $14.50 to $15, for any delivery up until July, 1917.

Buying Continues

St. Louis, Sept. 25.—Sales of pig iron in this market continue to indicate that a buying movement is on in reality. Two local stove foundries were purchasers last week, one for 1,000 tons and the other for 1,500 tons of southern No. 2 and 3; stove makers and foundrymen in Belleville, Ill., bought a total of 10,000 tons, mostly southern iron; an order for 500 tons of No. 1 was closed in the local market, and a sale of 1,000 tons of high silicon iron is reported to have been made.

Local sales agents are quite jubilant over conditions and the outlook for good business. Southern No. 2 is quoted in this market at $15, Birmingham, but it is reported that some off iron changed hands last week on a basis of $14.50. This could not be confirmed, however. Northern iron is held at $19, Chicago, and $18.50, Ironton.

Domestic Ferro

Is Being Booked Freely—Very Few Sales of English Alloy.

New York, Sept. 26.—Domestic makers of ferro-manganese continue to book the major portion of the going business in this alloy for delivery over the remainder of the present year and during the first half of 1917 upon the basis of $165, delivered to the consumer. Although some of the home producers recently made an effort to advance to $165, furnace, they have reverted to the former policy of selling at this figure on a delivered basis. The quotations of the domestic makers, accordingly, are considerably under the present price of $164, seaboard, for the English product, in most districts. As a result, very few new sales of English metal now are being made. During the past week, the domestic manufacturers entered probably 3,000 to 4,000 tons of additional business. There is a fair amount of new inquiry, including 1,200 tons for an Ohio steelmaker.

A sharp demand for bessemer ferro-silicon continues and prices have been advanced $1 per ton by Ohio makers to a basis of $31, furnace, for 10 per cent. It is estimated that recent sales of this metal have totaled at least 5,000 tons, some of which has been for export, and there is unclosed inquiry for 5,000 to 6,000 tons now in the market. One or two good-sized lots for foreign buyers are included in the latter. The Bethlehem Steel Co. was a buyer of 200 tons this week. There also has been considerable buying of 50 per cent ferro-silicon by both domestic and foreign buyers on which some variance of prices is noted.

There has been further buying of spiegeleisen for export, sales in the week of this kind running 500 to 1,000 tons. Domestic buyers are showing little interest. The market is represented by $40, furnace, for 20 per cent.

Indian Ore

Philadelphia, Sept. 26.—A sale of a tonnage of first-grade Indian manganese ore containing 50 per cent or more of manganese, has been closed with a domestic consumer at 65 cents per unit at tidewater. Delivery is to be made this year. Domestic manganese ore, which usually is higher in silicon than the imported, is not bringing as high prices as the latter, but there have been recent sales on the basis of 65 cents per unit, delivered to the consumer in the middle west. Some Brazilian ore for delivery late this year is being offered at 76 cents per unit at tidewater.

Lower Grades Active

Pittsburgh, Sept. 26.—Demand for lower grades of bessemer ferro-silicon continues heavy. Domestic consumers are buying for shipment the first and second quarters of 1917 and rather heavy demand exists for export. Furnaces are obtaining $30, furnace, for 9 per cent. Ferro-manganese is being held at $164, seaboard, for both prompt and future shipment. Demand is not heavy. Spiegeleisen is being quoted at $45 and above at the furnace for prompt and future delivery.

Capital Increased

Chicago, Sept. 25.—The Iroquois Iron Co. has increased its capital stock from $5,000,000 to $6,000,000, to provide additional capital and care for additions and betterments now being made at the plant in South Chicago. These include a pig casting machine and a mixer and bessemer converter, to make it possible to turn out steel ingots from the two larger stacks, as has been mentioned in these columns previously.

Acquires Plant

M. B. Kelly, of the American Steel Co., Pittsburgh, has acquired the plant of the Waynesburg Tin Plate Co., Waynesburg, Pa., which has been idle for several years. The plant consists of four hot mills and three cold mills and auxiliary equipment for manufacturing tin plate. Although no definite plans have been adopted, it is likely that Mr. Kelly will put the mills into operation at an early date for making tin plate.

(*For complete prices see page 662.*)

Sheet Stocks Disappear

And the Market Steadily Gains Strength—Higher Pig Iron Prices Being Watched With Interest

Youngstown, O., Sept. 26.—The sheet market is daily showing greater strength. The 3c minimum on black sheets, No. 28 gage, which has been generally observed for less than a week, is now being disregarded by practically all sheet mills in this district. Different mills are holding variously for 3.05c, 3.10c, 3.15c and 3.25c. One mill, for instance, which was quoting 3c a week ago, boosted its minimum to 3.05c on Friday, to 3.10c on Monday morning and to 3.15c on Monday noon.

Light sheets continue to sell freely at the advanced quotations. The heaviest export demand in months is lending added strength to the market, as this business is being taken by several mills on a 3.25c base. Domestic demand for light sheets continues heavy.

The certainty of increased costs in the fourth quarter also is adding strength to the finished sheet market. Last quarter sheet bars will cost most mills at least $3 a ton more than in the present quarter, the increase in some cases being as high as $8 a ton. The margin between cost lines and selling price is small with bars at $40 a ton and sheets at 3c a pound, and this situation has caused sheet mills generally to hold for higher prices. One factor that now makes finished sheet prices more responsive to fluctuations in sheet bar costs is the practical disappearance of the immense stocks of sheets that mills have had in their warehouses. These stocks were rolled from low priced sheet bars and while the costs of raw materials were advancing, mills have been content to dispose of these stocks at a lower figure than they could afford to roll new sheets. The total tonnage of these stocks was large, but warehouse floors are now practically clean. Present orders, therefore must be rolled from high priced steel.

Mills in this district are watching with interest the attempt of the railroads to do away with present special rates on goods for export. The carriers desire to enforce the domestic rate on export shipments, the increase from the Pittsburgh district being from 11 cents to 16.9 cents or $1.18 a ton. As export orders now on the books were taken on the assumption that the rates would remain unchanged, this figure, if the new tariffs are allowed, will represent a loss to the mills of that amount.

The increased strength of the pig iron market is encouraging the sheet mills to believe that bundled sheet scrap will show added strength. As 15 per cent of the sheet bars entering the mills is scrapped, any strength in the market for bundled sheet scrap will be an important factor in lowering operating costs. This scrap is now selling at $11.50 to $11.75 a ton, against $8 a ton at the time that semi-finished steel was quoted around $20 a ton. Bundled sheet scrap is inconvenient to handle and with pig iron at prevailing prices, mills have preferred to buy pig iron for use in their open-hearth furnaces. If pig iron prices continue to show strength, sheet mills expect bundled sheet scrap to be in greater demand.

Galvanized sheets are being held at 4.30c and 4.35c. The demand continues good. The market for blue annealed sheets also is strong.

The car situation is growing worse and every mill is experiencing great difficulty in securing equipment for handling shipments. In a number of cases, finished sheets are being held in the shipping rooms and warehouses awaiting the cars which the railroads are finding it more difficult to furnish.

Climb Slowly

Pittsburgh, Sept. 26.—Unusually heavy demand for galvanized sheets continues to feature the general sheet market. Mills are being called upon to ship material to galvanizing concerns and consumers of galvanized products are covering requirements for the remainder of the year. Manufacturers have had no difficulty in obtaining 4.25c for No. 28 gage material and it appears likely that prices will be advanced from $2 to $5 a ton before the end of the week. If shipments of galvanized sheets become much heavier, some mills will not be able to maintain deliveries of other products on the present basis.

No. 28 gage bessemer black sheets, as reported a week ago, now are being held at 3c by the American Sheet & Tin Plate Co. and no trace of any prices below that figure can be found. For open-hearth stock, mills are asking 3.10c. Blue annealed sheets continue to be offered at a range from 2.90c to 3c, although some makers are asking 3.10c. Demand for both black and blue annealed sheets is heavy. Because of the fact that sheet bars will command higher prices for fourth quarter delivery, sheet prices probably will be put up further at an early date.

Black Sheets Higher

Chicago, Sept. 26.—The strengthening influences which have been noted recently in the sheet market have finally brought a higher quotation on No. 28 gage black sheets, which are now selling at 3.19c, Chicago mill, the quotation $2 under this figure having practically disappeared. Blue annealed sheets have not advanced and remain at 3.19c, Chicago, as has been the case for several weeks. The higher cost of sheet bars is one of the influences and a strong inquiry for black sheets for export ranging from 100 to 5,000 tons is also having its effect.

(For complete prices see page 662.)

Premiums Are Disappearing

Philadelphia, Sept. 25.—New business in blue annealed sheets is developing less vigorously with eastern Pennsylvania makers and the market has eased up to the extent that former premiums no longer are obtainable. The usual price now named is 3c, Pittsburgh, or 3.159c, Philadelphia, for No. 10 gage blue annealed, though up to 3.25c, Pittsburgh, sometimes is quoted.

Prices Are Firmer

Cleveland, Sept. 26.—The demand for sheets is active and prices for the most part are firm. Some rather low quotations which have been named recently are attributed to a mill which will not have its plant in operation before Jan. 1.

Tin Plate Prices Named

Pittsburgh, Sept. 26.—Tin plate manufacturers have not yet opened books for shipment next season. The so-called "official" price of tin plate now is $5.50 a box for delivery this season, although most mills are asking $6 and above. New demand is not heavy, but specifications against contracts have not fallen off. While no official announcement has been made, yet it generally is believed that tin plate for 1917 delivery will command $5.50, base, or more.

Wire Advance

Is Believed to be Imminent—Russia Negotiating

Pittsburgh, Sept. 26.—Sellers and buyers of wire products look for an advance in prices at an early date, and it is not unlikely that quotations will be put up the end of this week or the early part of next week. Wire nails are being held at $2.60 a keg; that figure, compared with prices of other finished products, is regarded as low. Russia is negotiating for 70,000 tons of barbed wire and other foreign interests continue to be active factors in this market.

Jobbers are specifying more briskly and indications that the fall trade will exceed expectations. Stocks are described as low, but it is apparent that jobbers will not speculate at current prices. They are buying only for actual requirements.

Bar Users Are Troubled

Unable to Obtain Deliveries and Anxious to Make Additional Contracts—Decrease in Pressure from Automobile Manufacturers

Philadelphia, Sept. 25.—Some of the largest steel bar consumers in this district, including leading railroad systems, are making known to the mills, right along, their willingness to place contracts at current prices for last quarter or first half. It is estimated, there is easily 25,000 tons of such business in sight. Most of the makers, however, are not deviating from their policy of making few contracts for bars under present conditions. One mill, which has been making some bessemer bar contracts for last quarter and first half, some of these with the implement trade, reports that most of the tonnage which it cares to take on now is in hand. There have been also some contracts for bars closed by other makers with eastern bolt and nut manufacturers. Bars are quoted at 2.60c, Pittsburgh, to the general trade, though the implement manufacturers, as recently noted, have been able to get bessemer bars for first half at 2.50c, Pittsburgh, within a week or two. Specifications are in increased volume.

Steel Bars Far Ahead

Chicago, Sept. 26.—Steel mills are continuing to take contracts for steel bars without promise of delivery at the prevailing quotation of 2.79c, Chicago mill. Although most mills are booked for practically their entire output during first half of 1917, buyers are anxious to cover themselves still further and are inquiring and placing business for shipment at the convenience of mill without objection.

Business in finished steel generally is being booked at a greater rate than shipments and specifications are being filed on former contracts at a much heavier rate than new business or shipments.

Mills for the most part would prefer to have buying stopped and give them an opportunity to make some impression on their orders, but consumers apparently believe that they must buy now in order to obtain a favorable place on mill books for delivery during next year.

Hard steel bars are held steadily at 2.50c, Chicago mill, although a recent sale into the east was at somewhat under this figure. This was a small tonnage of unusually attractive size and the price was established in order to obtain the business to balance mill operations. For the most part, bars now being taken are in smaller sizes and the heavier sections are likely to bring a slight shading.

Strong Pressure for Bars

Pittsburgh, Sept. 26.—Demand for steel bars exceeds expectations. Mills find it extremely difficult to meet their obligations and some consumers are complaining bitterly about the failure of manufacturers to supply tonnage. Specifications against contracts this month likely will exceed those received in August. Steel bars are being held at 2.60c for delivery at the convenience of the mill.

Deliveries Delayed

Buffalo, Sept. 26.—A number of the leading agencies report that they are sold up to such an extent on bars and small shapes that deliveries are now extended to 10 and 12 months. Mills are compelled in many cases to choose the business they are now accepting and instances have occurred in the past week where established customers have been turned down through the inability of the mills to even attempt to meet their requirements. Prices are absolutely rigid.

Hard to Get Parts

Cleveland, Sept. 26.—The pressure for deliveries is tremendous. The only buyers who are showing any disposition to ease up a bit are automobile manufacturers, as the present is between season time and some of them are compelled to reduce output on account of inability to obtain parts.

Bar Iron Steady

Chicago, Sept. 26. — Makers of bar iron in this district continue to take business at 2.35c, Chicago mill, and the opinion is gaining strength that this quotation is likely to represent the market through the remainder of this year. Efforts have been made by some mills to increase this $1 per ton and some tonnages have been taken on that basis, but not in sufficient number to establish the market, as it is not difficult to place business at the lower figure.

Demand is becoming stronger and new business is being received by most mills at a greater rate than shipments.

Hoops and Bands

Pittsburgh, Sept. 26.—Demand for hoops and bands continues very heavy. Some of the larger mills virtually are out of the market for delivery before July 1, next. Stee hoops are being held at 3c and bands at 2.60c as a minimum.

Shafting Held at 10 Off

Pittsburgh, Sept. 26.—Some manufacturers of cold rolled steel shafting now are asking 10 off the list for carloads, or $5 a ton above the previously prevailing minimum price. Some trace of the 20 off the list price still is found. For less than carloads sellers are asking list price in many instances. Specifications continue heavy and new demand is described as brisk. Most mills are selling cautiously, not wanting to book material for delivery in 1917.

(For complete prices see page 662.)

Heavy Movement

Of Lake Superior Ore—Will Exceed Nine Million Tons

Cleveland, Sept. 26.—The movement of iron ore from Lake Superior mines has been very heavy this month and shippers are confident that the tonnage will be the largest of any September in the history of the trade. Some are willing even to predict that the wonderful August record will be equaled, but September shipments have never been known to equal those of August. It seems certain that the movement will exceed 9,000,000 tons.

Sale of Lake Ore

Philadelphia, Sept. 26.—A sale of about 15,000 tons of old range nonbessemer ore for October-November delivery has been made to a large eastern Pennsylvania steel company at 25 cents over the present season's schedule of $3.70 at lower lake ports. A tonnage of old range bessemer ore for the same delivery also is being offered at an advance of 40 cents per ton, over the present schedule. This transaction and the negotiations now going forward are interesting as illustrating the advanced prices on lake ore the miners are disposed to ask on any new sales.

Nuts, Bolts and Rivets

Pittsburgh, Sept. 26.—Demand for nuts, bolts and rivets continues decidedly heavy and manufacturers say they experience no trouble in obtaining prevailing prices. Rather heavy demand exists for shipment abroad but most makers are not attempting to entertain inquiries for export, on account of their inability to take care of their domestic trade.

By granting a 15 per cent increase in pay and re-instating four men who had been discharged, the International Nickel Co., Bayonne, N. J., has averted a strike of its 1,500 employes.

Structurals Are Advanced

Quotations Are Marked Up $2, But Still Higher Prices Are Made by Independent Companies

Pittsburgh, Sept. 26.—Effective today, leading manufacturers of structural shapes advanced prices $2 a ton and now are quoting 2.70c for delivery at their convenience. Since steel bars and steel plates are not affected by today's changes in price, it is believed that manufacturers are trying to establish the old differential between the prices of steel bars and shapes. Demand for structural material continues heavy, although no large contracts have been placed in this district this week. Fabricating shops, however, are being operated at maximum capacity.

Stronger Conditions

Philadelphia, Sept. 26.—Stronger conditions in structural steel prices continue to be indicated by the attitude of eastern sellers. One mill is asking 2.75c, Pittsburgh, or 2.909c, Philadelphia, as a minimum for standard sections, and is not active for orders at that price. Others are naming 2.60c, Pittsburgh, and upward, depending on the buyer and delivery. Mill obligations do not decrease, for while new building work is not active, there is enough miscellaneous tonnage constantly to fill in behind that which is being shipped. Notwithstanding the fact that in numerous cases their shops are not full, fabricators do not seem anxious for new work, due to the difficulties of getting material and to labor conditions, which make deliveries and profits very uncertain.

Increasing Demand

Buffalo, Sept. 26.—Mills and agencies of the district report an increasing demand for structural material, particularly for delivery during April and May of next year in time to go into building operations that are planned to take place with the passing of the winter season. The fabricators report that prices are being held firmly by all the mills at 2.60c. base, and that shortage of labor rather than prices of material is a factor in holding back an even greater demand for steel for construction purposes.

Shape Demand Better

Chicago, Sept. 26.—Demand for structural shapes seems to be growing as the possibility of a lower price becomes more remote. An unusual number of projects was placed during the past week, although most are for small tonnages. This business continues to come from railroads and industrial concerns almost exclusively.

The price of structurals remains steady at .79c, Chicago mill, but it is difficult to place orders for delivery earlier than second or third quarter of next year.

CONTRACTS AWARDED.

Vandalia Railroad Co., three riveted truss spans and one plate girder span for Indianapolis & Frankfort Railroad Co., 778 tons.

Minneapolis, St. Paul & Sault Ste. Marie Railway Co., extension to ore dock, Superior, Wis., 478 tons to American Bridge Co.

McNeil & Higgins Co., building for Chicago Dock & Canal Co. at Chicago, Ill., 380 tons to Hansell-Elcock Co.

Anaconda Copper Mining Co., penstock for rainbow station of Great Falls Power Co. at Butte, Mont., 363 tons.

Garfield Chemical & Mfg. Co., extension to Chamber Bldg., 225 tons to Kansas City Structural Steel Co.

The Denver Union Stock Yards, office building at Denver, Col., 181 tons to Hansell-Elcock Co.

Fort Dodge, Des Moines & Southern Railroad Co., one complete railroad bridge, 175 tons.

Yazoo & Mississippi Valley Railroad Co., transfer belt gallery at New Orleans, La., 167 tons to Virginia Bridge & Iron Co.

American Refractories Co., sand and stone storage bins at Danville, Ill., 127 tons.

St. Louis Portland Cement Works, material bunkers at Prospect Hill, Mo., 122 tons to American Bridge Co.

Morgan Park Co. (Minnesota Steel Co.), club house at Morgan Park, Duluth, Minn., 108 tons to American Bridge Co.

Ferguson apartment, Eighty-seventh street and Amsterdam avenue, New York City, 1,000 tons, to the Harris-Silvers-Baker Co.

Paterno apartment, West End avenue, New York City, 700 tons, to the Passaic Structural Steel Co.

Tishman apartment, Seventy-seventh street, New York City, 700 tons, to Hinkel Iron Works.

Southern hotel, Baltimore, 1,200 to 1,500 tons, general contract to Longacre Construction Co.

CONTRACTS PENDING.

Abbott Road bridge, bascule type, by city of Buffalo, bids received for type requiring 800 to 900 tons structural, but not yet opened. New bids are to be received allowing for competitive designs.

Rice & Adams Dairy Machine Co., Buffalo, plant addition. Architect G. Morton Wolf, Buffalo, taking bids on steel construction requiring 217 tons structural and on reinforced type taking 85 tons of reinforcing bars.

Soon Settled

Chicago, Sept. 26. — Difficulties with common laborers at the East Chicago plant of the Republic Iron & Steel Co. which caused a curtailment of mill operation during last week have been settled by the men returning to work on the former basis. The trouble caused some interruption of work but the plant was kept in operation on part schedule in spite of difficulty. About 100 men were involved and the cause of the strike was demand for higher wages.

(For complete prices see page 662.)

Cast Iron Pipe

Very Little Demand Since Recent Price Advance

New York, Sept. 26.—All the leading eastern makers of cast iron pipe now have joined in the advance of $1 a ton in prices which certain foundries announced a week ago. The market is quiet, there being scarcely any public lettings now before the shops and private buying also has been slowing down. Labor conditions, as well as the higher prices now quoted, are believed to be adversely affecting the situation. The demand for flange and machine work is active.

Slow in the West

Chicago, Sept. 26.—Although conditions in the market for cast iron pipe brought about an advance of $1 per ton last week, new business is exceedingly slow and practically nothing is under consideration in the west. The only tonnage of importance is 700 tons for a special assessment improvement in Chicago on which bids will be opened next week. The Glamorgan Pipe & Foundry Co. is the successful bidder on 280 tons at Viola, Ill., although the award has not been made formally, as it must be laid over a definite period under the municipal rules.

Dimmick Plant Active

Birmingham, Ala., Sept. 25.—An additional high pressure water pipe plant was put in commission during the past week by the United States Cast Iron Pipe & Foundry Co., being the old Dimmick pipe plant located at North Birmingham. This plant has been idle for the past two years. It is the purpose of the company to gradually work up a large output. The Talladega Pipe & Foundry Co., Talladega, Ala., was also formally organized for the manufacture of soil pipe and fittings. The plant will have a capacity of about 20 tons per day. Conditions in general have improved in the pipe industry and prices have advanced $1 per ton on high pressure pipe, being as follows per net ton, f. o. b. cars at the plants: Four-inch, $26; 6-inch and up, $29, with $1 per ton extra for gas and 16-foot pipe.

Richard Morgan Olcott, president of the National Cellular Steel Co., died at a New York hospital, Sept. 23, aged 55 years.

Ships for the Argentine

Ten Which, it is Expected, Will Be Built in This Country, Will Cost $25,000,000—Active Plate Demand Continues

New York, Sept. 26.—The Argentine government, according to well-defined reports, is figuring upon having built in this country 10 merchant vessels of large size at an aggregate cost of about $25,000,000. The financing of this proposition is said to have been completed by New York banks. The Bethlehem Steel Co. is credited by reports as likely to receive this contract. New England ship builders have been in the market for some round tonnages and this business is understood to have been closed. A leading car builder who was inquiring for a tonnage to cover recent orders taken has satisfied this requirement.

Government Work Prominent

Philadelphia, Sept. 25. — Buyers of plates other than the shipyards which recently have been the most conspicuous factor, again are beginning to take a large part in the plate market. Leading locomotive, car and boiler manufacturers have opened negotiations for contract tonnages for first quarter and appear to be willing to pay the 4c, Pittsburgh, prices quoted for that period for first quarter. One buyer, in fact, placed 12,000 tons and another 2,500 tons for first quarter at that figure. The Standard Oil Co. also is in the market for large future requirements. In ship steel, the demand continues at high gear. Although the material for three boats, 6,000 to 8,000 tons for late next year has just been placed with an eastern maker by a Pacific Coast yard, not many new merchant vessel contracts now are being closed. This is explained by the fact that a number of the yards are giving precedence to the government naval program and are holding back work of the former character until after the bids for the new war craft are opened Oct. 25, and the awards are indicated. Then these yards which have open space are expected to enter a number of additional merchant contracts, of which many are offering. A Nova Scotia shipyard bought 1,000 tons of ship plates for last quarter at 3.75c, Pittsburgh, and 1,000 tons for first quarter at 4c, Pittsburgh. About 5,000 tons of other marine business were taken this week by one maker here at 4c, Pittsburgh. Another eastern Pennsylvania mill the past week refused an offer slightly under 4c, Pittsburgh base, for 7,500 tons of ship plates for the latter part of 1917. A third eastern maker reports its ship plate capacity is booked full until Oct. 1, 1917. A Delaware ship yard has asked for protection on 12,000 tons of steel covering its bid to the government on the 20 destroyers now up. The Carnegie Steel Co. will furnish the government the approximately 10,000 tons for the construction of a fuel supply and a hospital ship in navy yards, promising 300 days shipment.

Despite the great strength of the plate market, there is an absence of uniformity in prices and some mills quote from 3c to 3.25c, Pittsburgh, promising surprisingly early shipment at that level. Marine boiler plates have been sold in the east as high as 10 cents per pound, and some makers who were quoting 8 cents now have raised to the higher figure.

Plate Demand Tremendous

Pittsburgh, Sept. 26.—Notwithstanding the tremendous demand for steel plates, which has characterized the market for several months, consumers continue to press manufacturers for material. The railroads have been forced to enter the market for cars, but additional cars cannot be supplied to relieve the car shortage this year. Pending inquiries for railroad cars involve 20,000 cars and orders for fully 4,000 cars have been placed recently. Car building departments are not being operated at maximum capacity and some manufacturers would be in need of tonnage, if it were not for the fact that they have been able to manufacture war material.

The government and foreign nations are active factors in the market for ship material. Bids have gone in on about 15,000 tons for a fuel supply ship and a hospital ship, to be built on the eastern seaboard. Some mills are asking 4c for both prompt and future delivery, but leading mills in this district are quoting 3c for shipment at their convenience.

Plate Demand Strong

Chicago, Sept. 26. — Although most plate makers have sold their entire output to the middle of 1917, both domestic and export inquiry for plates to go into ships and cars continues to be strong. Tonnages on which quotations are being asked range as high as 15,000 tons and prospective buyers do not ask the price but are offering 4.19c, Chicago mill, for any reasonable delivery. The earliest delivery that any large maker can promise is second quarter, but efforts are still being made to place large business for first quarter delivery.

The nominal price for plates for indefinite delivery by the leading interest remains at 3.19c, Chicago mill.

(For complete prices see page 662.)

Coke Workers

Are Scarce in the Connellsville Region—Prices Firm

Pittsburgh, Sept 26. — The Connellsville coke market reflects strength. Blast furnace fuel for prompt delivery has commanded as high as $3.25, ovens, and it is reported that 48-hour fuel for shipment next year has been sold at $3, ovens. The car supply is just about normal and new demand is not heavy, but not much coke is available for prompt delivery. The labor situation in the Connellsville regions is rather acute. Coke oven employes are not plentiful and many coke drawers are refusing to work full time. Foreign holidays are being observed more frequently than during times of depression. Some cokemakers say they have been unable to get men to load cars. Foundry coke is being held at $3.50, ovens, by some of the more important manufacturers. Production of coke the week ending Sept. 16, according to *The Connellsville Courier*, was 393,447 tons, compared with 384,374 tons the week before.

Strong at Cincinnati

Cincinnati, Sept. 25. — Sales of coke are not numerous, but the market is strong. Practically all furnaces in this territory closed for requirements during the past two weeks. It is estimated that orders taken during the month of September aggregate between 25,000 tons and 30,000 tons a month, for the next six months, of Wise county, Pocahontas and New River grades. Although specifications are heavy, ovens have now caught up with shipments and deliveries are being made on time.

Box Car Shortage.

Cleveland, Sept. 26.—Foundries are being much embarrassed by inability to obtain box cars for the transportation of coke. They are also having trouble in getting laborers to fork the coke from gondolas. The movement of coke is slow and uncertain.

A Few Contracts

St. Louis, Sept. 25.—A few contracts for coke for delivery over the first quarter of next year have been closed within the last few days, and better business in this line is expected. Connellsville standard grades are held at $3.50, ovens, and New River foundry grades at $4.50.

The Alan Wood Iron & Steel Co. is preparing to build at Ivy Rock, Pa., a 3-story and basement office building, 112 x 47 feet.

Scrap Prices Advancing

Market Develops Strength in Leading Centers—Heavy Melting Held at $19 and Above at Pittsburgh

Pittsburgh, Sept. 26.—The market for old materials has developed considerable strength this week. Prices have shot upwards, from 25 cents to $1 a ton in many instances, and indications are that the skyrocketing tendency of the market will not cease for several weeks. Heavy melting steel is being held at $19 and above. Some of the heaviest consumers of the district quietly are negotiating for requirements; fully 75,000 tons are involved in pending inquiries.

Most dealers have enough tonnage on hand to meet demand, but some jobbers have been scrambling for tonnage. Such stocks as rerolling rails, malleable, bundled sheets, No. 1 wrought, cast and low phosphorus are being held at about 50 cents a ton above previously prevailing prices.

Beam Crops Sold

Philadelphia, Sept. 25.—An eastern Pennsylvania maker of structural shapes has sold 10,000 tons of beam crops to another eastern Pennsylvania maker at $16.50, delivered. This material is of better grade than ordinary heavy melting steel, which remains not over $15, delivered, eastern Pennsylvania. The old material market in this district continues disappointing, for, though the tone is better, there is not the buying volume to back it up. The best demand is in railroad wrought and wrought pipe and the latter again advanced $1 a ton this week. There is also better buying in cast borings at higher prices. Heavy melting steel, while it shows a better sentimental condition, probably due to a more active market at Pittsburgh, still is sluggish.

Increased Activity

Cleveland, Sept. 26.—Considerably increased activity has come about in the iron and steel scrap market here due to a demand from some consumers in secondary lines of scrap, and to the activity of dealers in covering on old orders. Mills continue to offer less than dealers are paying for heavy melting steel and thereby signify their lack of interest in the present situation. In heavy melting steel, the market is strong and looking upward, due to better market conditions and to possible buying of mills in the near future. Offers of $16.50 for shop heavy steel have come from a local mill. Higher grades of steel have brought better prices. A user of busheling has bought heavily of No. 1 material and some machine shop turnings. A sale of No. 1 railroad wrought also has been reported. Machine shop turnings and axle turnings are weak due to lack of a market and to enormous production. Bundled sheets also are relatively weak in the face of the bull market that happens to prevail at the present writing.

Chicago Scrap Steady

Chicago, Sept. 26.—Strength continues to be manifested by the scrap iron and steel market in Chicago, although some influences have been at work which have had a tendency to limit activity. Labor troubles have caused an embargo for the past week by one important consumer which will remain in force during the present week also. In spite of this, some items have advanced 25 cents to 50 cents per ton and the general level of the market is high. Trading is being done at a fair rate and prices are holding at a good level.

Dealers still have the opinion that a buying movement must follow before long and are holding their material to be prepared when this comes.

Railroads are offering larger lists than during the late summer, but the market is absorbing them without difficulty. The Great Northern railroad is offering 6,000 tons, one-third of which is steel rails, the Burlington railroad is offering 2,500 tons, George W. Jennings, 1,700 tons and the Wabash railroad three miles of rails and fastenings which will amount to about 300 tons.

Heavy Melting Advances

Buffalo, Sept. 26.—Heavy melting steel in the face of an increasing demand has advanced 50 cents per ton during the day and no large tonnages are available at the new price of $16 to $16.50. Some sales have been made in the past 24 hours at $17 and dealers report that further advances in the price of this commodity are due to take place according to present indications. The demand upon the local yards has become such that scarcity of labor, it is stated, has prevented the dealers from putting the scrap in shape for charge box sizes.

Railroad cast is in good demand and price has been advanced to $16 to $16.50. There is also a strong demand for low phosphorus steel scrap and this has resulted in an increase of $1 a ton in the price to the new schedule of $21 to $21.50.

Demand Increasing

Birmingham, Ala., Sept. 25.—Dealers in old material have come to take a rather optimistic view of the scrap situation, particularly from the fact that each week is demonstrating the increased demand for steel scrap of all kinds. Cast scrap is also in much better demand and stricter attention is being paid to its grading. Some heavy sales of steel scrap were made the past week, and several carloads of machine shop turnings and borings were sold. Heretofore this material has not been in demand in the south.

Active at Cincinnati

Cincinnati, Sept. 25.—The iron and steel scrap market has been greatly encouraged in the past few days by good buying from foundries. Rolling mills are also taking better lots and shipments today are heavier than for several months. Prices are unchanged, but are very strong, and the tendency is to advance. Heavy melting scrap, which is in greatest demand at present, is quoted from $14.75 to $15.25, per gross ton.

Prices Advance

St. Louis, Sept. 25.—Prices of scrap in this market continue to advance, and several large consumers have entered the market for steel and rolling mill scrap at the prevailing quotations. Dealers, however, are still speculating, and are buying heavily and whenever possible are holding their accumulations for a higher market. Prospective purchasers of relaying rails, both standard and light sections, are scouring the market for deliveries, but without success, as railroads are not offering relaying rails and dealers' stocks are about exhausted. The only offerings before the market this week are: Chicago, Burlington & Quincy, 2,900 tons; Nashville, Chattanooga & St. Louis, 1,650 tons.

(For complete prices see page 662.)

Will Install New Machinery

The Union Chain & Mfg. Co., Seville, O., has increased its capital stock from $20,000 to $40,000, in order to take care of its rapidly growing business. Additional machinery will be purchased, including turret lathes for boring and turning sprocket wheel blanks, multiple spindle drill of the circular type, automatic gear cutter suitable for series cutting, key seating machine, rolling mill for reducing steel strips up to eight inches, automatic screw machines, etc. A New York office has been opened at 47 West Thirty-fourth street, in charge of J. R. Shays Jr.

The Westinghouse Machine Co., East Pittsburgh, Pa., plans to erect a plant at Essington, near Philadelphia.

Billets Are Very Scarce

Both Foreign and Domestic Buyers Compelled to Pay High Prices—Sheet Bar Adjustments at $40 to $45

Philadelphia, Sept. 25.—Foreign buyers continue to canvass the eastern Pennsylvania works for rerolling steel and are picking up material wherever they can find it at attractive prices to the seller. Italy has concluded with a large eastern Pennsylvania steel maker a purchase of 10,000 tons or more of rail and ingot crops and is understood to have paid a very liberal figure. Another eastern Pennsylvania maker of open hearth billets sold some good-sized tonnages to Italy and England from an unexpected surplus. Prices of $48 to $50, tidewater, or only slightly below the domestic market, are obtainable on export orders. The domestic market on semi-finished steel shows practically a duplication of that to be found in the foreign field, namely that there are more buyers than sellers and material is scarce. A Harrisburg plate maker who asked 10,000 tons of slabs still is negotiating and a smaller eastern Pennsylvania plate mill now is in the market for the same form. There is more or less buying of shell bar crops and discards from eastern mills at $32.50, mill, and upward. A sale of a lot of irregular bessemer billets at $43, Ohio mill, is noted, but the transaction was not made here. Eastern producers hold open hearth billets at $48, mill, minimum, and forging steel at $65, mill. Special forging billets have been sold at 5½ cents per pound at eastern Pennsylvania mill. They are taking very few orders as they are sold up practically to July, 1917.

Name Price of $45, Mill

Pittsburgh, Sept. 26.—The Carnegie Steel Co., in readjusting contracts for sheet bars and billets for delivery the last three months of this year, named a price of $45, mill, for bessemer and open hearth material. Owing to the fact that most of the important consumers obtained semi-finished steel through long term contracts, it is difficult to define the market definitely. It is not unlikely that some tonnage will be shipped at as low as $42 a ton by some manufacturers. Specifications for billets and sheet bars are as heavy as ever and complaint is heard about the scarcity of steel. Sheet mills and tin mills are being driven at maximum capacity and buyers of billets are ope-

Lower Than Pittsburgh

Youngstown, O., Sept. 26.—Price adjustments made last week on contracts for sheet bars for fourth quarter delivery are understood to have been on the basis of $40 a ton. While $45 a ton was named in the Pittsburgh district by a leading interest, that figure was not attained in this district on old contracts. At the same time, some sheet bar consumers are understood to have purchased sheet bars some months ago for last quarter delivery at $45 a ton. The semi-finished steel market is strong, but the absence of tonnage for sale precludes a test of present quotations of $45 to $50 a ton. Steel mills here have commitments for months ahead and in most cases would probably welcome opportunities to buy rather than sell semi-finished steel. The character of the inquiries for steel will have an influence on the quotations that mills will make, as they are disposed to favor the domestic trade.

No Rods Obtainable

Buffalo, Sept. 26.—Many mills and agencies report they are entirely out of the market and the scarcity of rods seems to be getting more pronounced. One mill reluctantly quoted, it is stated, a price of $62.75 per gross ton on a 1,000-ton inquiry, because the demand came from a long-established customer.

Very Strong at Cleveland

Cleveland, Sept. 26.—The finished material market in the Cleveland district is very strong and it is difficult to get sheet bars, billets or slabs at any price. One Cleveland steel company is understood to have paid $46 for sheet bars and some sales have been made as high as $50.

Cold Rolled Strip Steel

Pittsburgh, Sept. 26.—Cold rolled strip steel manufacturers have not yet opened books for 1917 shipment and it may be three weeks or a month before orders calling for delivery next year are accepted. For shipment at the convenience of the mill, cold rolled strip steel is being quoted at a range from 6c to 6.50c, base.

The American Brass Co., Waterbury, Conn., plans the erection of houses for 52 families in that city to assist the Scovill Mfg. Co., in solving the housing problem. They will be built and disposed of on the same general plans as the Scovill Mfg. Co., proposes to do with its houses now in the course of construction. The houses will be designed for the accommodation of single families and will be sold to trustworthy employes of the company with the speculative element entirely eliminated.

(*For complete prices see page 662.*)

Warehouse Prices

Are Advanced at Leading Centers—Demand Active.

Pittsburgh, Sept. 26.—Effective Sept. 21, warehouses advanced the price of shapes and bars $3 a ton and put up the price of steel plates $5 a ton. The last previous change in warehouse prices was made under date of March 14, last. Demand for material for immediate delivery continues as heavy as ever, warehouse managers say. Fabricators in many instances, have been forced to pay warehouse prices for material needed immediately, on account of inability to obtain deilveries from the mills. Pittsburgh warehouses now are quoting shapes, at 3.25c; plates, 3.75c; bars and small shapes, including flats, rounds and squares under 2 inches in diameter, 3.25c; rounds and squares over 2 inches in diameter, 3.90c and reinforcing bars, ¼ inch and larger in diameter, 3.40c.

Chicago Stores Advance

Chicago, Sept. 26. — Chicago warehouses have advanced prices on bars and shapes $3 per ton from 3.10c to 3.25c, Chicago store. This advance follows the change made on plates last week when they were moved from 3.60c to 3.75c, Chicago store. Demand for steel products from store is heavy and seems to be increasing as mill deliveries become more remote.

Willing to Pay

Cleveland, Sept. 26.—The recent advances in prices of shapes, plates, bars and hoops have had little effect on the market. Buyers are willing to pay any reasonable price, if they can get deliveries. Warehouses, however, continue to have trouble in keeping their stock replenished.

Warehouse Prices Up

Cincinnati, Sept. 25.—Continued demand and the general strength of the market has caused warehouse prices to be advanced. Cold rolled bars are still holding at 10 per cent plus the list price, but hot rolled bars are quoted from 3.35c to 3.90c. Shapes and plates have advanced to 3.35c to 3.50c. Warehouse prices on sheets have not advanced, but are expected to do so before the end of the present week.

New Buildings

Are Numerous in Dayton—Much War Business Taken.

Dayton, O., Sept. 25.—Construction work in this city during 1916 has surpassed any other year in the history of this city. Factory extensions and office buildings are going up rapidly to take care of the influx of business. Adam Schantz Jr. is alone spending $1,500,000 on office buildings this year. His building campaign has not yet ceased.

E. A. Deeds and C. F. Kettering, principal owners of the Dayton Metal Products Co. (the Delco), will erect a number of buildings at Industrial City, two miles south of Dayton. Four buildings are included in their plans at present, and there will eventually be more. The first building, now under construction, will cost about $175,000, and will house the Domestic Engineering Co. The next structure will probably be the power plant building. Plans for the rest of the building program are soon to be made. The Engineering Club is to have a new home, 198 x 198, on the river front. It will contain a library and lecture hall. Bids will be received by Schenck and Williams in October.

Contracts with the Allies for shells have brought much business to Dayton. One iron company has a contract for $1,500,000 with the Russian government. Timers and detonators, made first as by-products, are becoming quite as important as the principal articles of manufacture.

Higher Coke Prices

Pittsburgh, Sept. 27. (By wire.)—Eastern consumers have bought Connellsville furnace coke for prompt delivery at $3.25, ovens, and that figure represents the market today. Furnace fuel for shipment next year is being quoted at $3, ovens, at which price one consumer already has covered requirements. Inquiries for contract fuel involve 40,000 tons a month. Foundry coke is selling at $3.50 to $3.75, ovens.

Not Yet Uniform

Pittsburgh, Sept. 27. (By wire.)—All manufacturers of structural shapes have not yet adopted the 2.70c figure for shipment at their convenience, but the 2.60c price likely will disappear before the end of the week. One mill is quoting 2.85c for shipment before the end of this year.

The Nashville, Tenn., Machine Co. has shortened its hours from nine to eight, and as it has continued its men on the old basis of pay, there has resulted an advance of 12½ per cent in wages. The new system, which went into effect last week, embraces all of the departments, including machinists, electricians, pipefitters and elevator repair men. There was no request for higher wages or shorter hours on the part of the men, the change being entirely voluntary.

New Rail Line

Will be Built by the Pan Handle Along Ohio River.

The last stretch of unoccupied river frontage on the Ohio river between Pittsburgh and Wheeling is about to be opened up, according to an announcement made by Ralph W. Cooke, industrial agent, Pennsylvania Lines West of Pittsburgh.

A new line 12 miles in length is to be constructed by the Pittsburgh, Cincinnati, Chicago & St. Louis Railway Co. (Pan Handle), commencing at Chester, W. Va., and skirting the south bank of the Ohio river east as far as the mouth of Raccoon creek, which is about 3 miles below Beaver.

The Pan Handle now has a branch, known as the New Cumberland branch, from New Cumberland Junction, just east of Steubenville on the main line, north through the thriving industrial towns of Weirton, New Cumberland and Chester, a distance of approximately 23 miles and the new line will be a continuation of this branch.

Construction will be started immediately and it is the intention to have the extension in complete operation some time in the coming year. Ferguson & Edmundson, of Pittsburgh, have been awarded the contract for the construction of the first portion of the road.

The importance of this development lies in the fact that it will open up extensive acreages of high, level ground, with river frontage suitable for large manufacturing plants.

The Steel Corporation has plants at Mingo Junction, Steubenville, Wellsville, Martins Ferry and Bellaire in Ohio and at Chester and Wheeling in West Virginia, all of them along this stretch of river front.

Wire drawers employed at the Schoenberger Works of the American Steel & Wire Co., Pittsburgh, received a slight increase in wages recently. A number of employes had been on a strike.

The strike at the plant of the Sharon Steel Hoop Co., Sharon, Pa., was broken Sept. 7, when a majority of the men employed returned to work.

Huge Tonnage

Of Steel Pipe Required for Building Oil Lines

Pittsburgh, Sept. 26.—One of the largest inquiries for steel pipe to appear in many years came out a few days ago, when a couple of construction companies asked bids on 800 miles of line pipe, involving 600 miles of 8-inch and 200 miles of 6-inch material, for an oil line to extend from the Tulsa, Okla., fields to Chicago. The line, which will be laid for the Sinclair Oil & Refining Co., will require about 60,000 tons of pipe, some of which, it is understood, already has been reserved, it being reported that three mills in this district have made arrangements to supply the tonnage. Pipemakers say that this project is one of the largest undertaken in the history of the trade.

Specifications for steel pipe continue heavy. Prevailing discounts are being quoted by all mills and no reports of concessions are heard. Demand for boiler tubes has not fallen off and the seamless tube trade continues active.

Anglicised German Tube Company

The anglicising movement which has absorbed so many German works in Great Britain has resulted in the transfer to British owners of the German interest in the British Mannesmann Tube Co., Ltd., Swansea, Wales. The German shares in this company have now been sold by the public trustee to a British group of capitalists, which includes Sir Hugh Bell, A. J. Dorman, Belfour Williamson & Co., and Higginson & Co. It will be seen that this group includes some of the best known steel magnates in Great Britain.

The transfer of the shares was taken under the trading with the enemy act of 1916, which gives the board of trade power, when there is a predominant enemy interest, either to wind up the firm, or to vest the enemy interest in British hands. The enemy shares were put up to open tender. There were only four British buyers, but the price paid was considerably in excess of that for which the owners were prepared to sell at the outbreak of the war.

Grand Haven, Mich., has secured the factory of the Keller Tool Co., of Fond du Lac, Wis. The concern will soon start the construction of a brick and steel factory building. Approximately 200 toolmakers will be employed.

Hearty Hospitality

Extended at Meeting of Pig Iron Makers at Detroit.

In response to an invitation from F. W. Hutchings, treasurer of the Charcoal Iron Co. of America, the members of the Cleveland district of the American Pig Iron Association and a number of representatives from other districts met in Detroit last Friday and Saturday as guests of the company. Mr. Hutchings has long been considered a man of unusual ability as a purveyor of charcoal iron, and the coke iron makers who attended the Detroit meeting agree that as a provider of entertainment he has no equal.

The guests were met at the Pontchartrain hotel Friday with automobiles and taken to the Bloomfield Hills Country Club. From that time until Saturday night, when they left the city, hospitality was unlimited.

Optimism Disclosed at Meeting

The formal meeting of the association was held Friday morning and a thoroughly optimistic feeling prevailed in regard to the pig iron market. After luncheon, the important business of golf was undertaken. In the evening, at 7:30, when the guests were ushered into the banquet room, they found a large table beautifully decorated with flowers. The places were formed around the outside of a rectangle, the center of which was lowered about 18 inches and was made to represent a charcoal iron furnace and chemical plant, with miniature lakes and steamboats in the outlying districts and beautiful roads and green lawns leading up to railroad tracks and the buildings usual to such plants. A miniature railroad electrically operated with a locomotive and cars made frequent trips around the plant. Mr. Hutchings as toastmaster was exceedingly happy. He read some interesting fake telegrams which caused a good deal of fun. William McLauchlan, of Pickands, Mather & Co., had some entirely new stories and a number of others contributed cleverly to the enjoyment of the evening.

On Saturday the golf playing consisted of handicap matches for the lowest medal score, a beautiful cup being presented for this event by Mr. McLauchlan, and won by S. A. Hine, of Girard, O. Another match was for the lowest medal score with handicaps applying for one who had not won a prize at association meetings. The cup, presented by Leonard C. Hanna Jr., was won by T. E. Friend, of Pittsburgh. The third match was a kickers' handicap, for which a fixed medal score was played, each member selecting his own handicap, the fixed score being blind. The cup was presented by the Charcoal Iron Co. of America and was won by Frank B. Richards, of M. A. Hanna & Co., Cleveland.

Cromwell Steel Co.

Will Build Plant at Lorain—Will Make Forgings

J. C. Cromwell, of Cleveland, and associates have organized The Cromwell Steel Co. under the laws of Ohio, with a capital of $2,000,000 to build a steel plant at Lorain, Ohio. The company has purchased 233 acres on the Black river in Lorain opposite the plant of the National Tube Co. The site has a frontage of 2,500 feet on the river and the new plant will be served by the Lake Shore, Pennsylvania, Nickel Plate and Baltimore & Ohio railroads. The first unit will consist of four 75-ton open-hearth furnaces with rolling mill and necessary equipment. There is room on the property for four blast furnaces which will probably be the ultimate development, but in the beginning, the company will be a buyer of basic pig iron. It will not sell any semi-finished material and its principal product will be forgings of many sizes, such as are used by automobile concerns and other companies in Detroit, Cleveland and other cities not far distant from Lorain. It is expected that the work will be started on the new plant immediately and pushed to early completion.

The officers of the new company will be: President, J. C. Cromwell; vice president, W. D. Batsholts, Paris, France; general manager, Allan C. Ryan; secretary, Edwin S. Griffiths, and treasurer, G. L. Jones. Mr. Cromwell was for several years connected with the Illinois Steel Co., but has been a resident of Cleveland since 1897. He is well known as an engineer and designer of blast furnaces, steel plants and finishing mills. Mr. Ryan was for several years superintendent of the rail mill of the Tennessee Coal, Iron & Railroad Co. and held a similar position for several years with the Bethlehem Steel Co. Mr. Griffiths is president of the Cleveland Machinery Mfg. Co., the Bishop & Babcock Co. and the Buckeye Engine Co.

The Pannier Bros. Stamp Co., Fernando street, Pittsburgh, has completed plans for the erection of a 4-story building, 24 x 100 feet, at Sandusky street and Cajou alley, North Side, Pittsburgh. The company will occupy the entire building. The fourth floor will be used exclusively for the manufacture of steel stamps.

Strike Ended

And Machinists at Milwaukee Gain Nothing.

Milwaukee, Wis., Sept. 25.—The Milwaukee machinists' strike for the eight-hour day, which was inaugurated by a series of walkouts in the principal metalworking shops on the morning of July 18, is declared to be at an end in a formal statement to the public issued today by the Metal Trades and Founders' Association of Milwaukee. The strike has failed utterly, the men not having gained a single point of their contentions. Although some shops were seriously inconvenienced for a time by the walkouts, every one was able to keep up production at a fairly good rate, and at this time all are operating practically with normal forces.

The employers' statement in part is as follows:

"It is said that in one or two shops the whistle will be blown at the end of 52½ hours. In other shops, the whistle will not be blown until the end of 55 hours. Whatever the arrangements are as to details, the employers have granted no increase in wages for the first 9½ hours per day or the first five hours on Saturday, and that for the overtime only the 50 per cent increase voluntarily granted on July 1 has been allowed."

Interviews with factory managers and others who have been in close touch with the situation show that the strike has won nothing for the machinists.

G. Thexton, factory manager of the Gemco Mfg. Co., declares that conditions are good in the shops of this company. He said: "The machine shop now is running practically full and the polishing department is running full. The men came back unconditionally to work under the schedule of hours agreed upon by the employers on July 1. No concessions whatever were made to men who have been coming back gradually since the strike was declared. The polishers came back in a body on Sept. 11."

Theodore O. Vilter, president of the Vilter Mfg. Co., says that the men have come back to work unconditionally and that on Sept. 18 the strike at the plant was declared off. Last Wednesday, he says, 35 men came to work under the conditions that obtained on July 1. Mr. Vilter says that immediately after the strike was called, the non-union men, sympathizers that walked out, started to come back, and that 10 days later union men began to come back in ones and twos.

MEN OF THE IRON TRADE

Who they are **Where they are** **What they are doing**

CHAIRMAN E. H. GARY, of the United States Steel Corporation, who for several months past has been touring Japan and the Far East, arrived at Seattle, Sept. 23.

Scott R. Rogers has been appointed a salesman for the United Steel Co., Canton, O., in the Cleveland territory.

S. C. Millett, of Millett, Roe & Hagan, New York, has been elected a director of the Virginia Iron, Coal & Coke Co.

William H. Bodine, general superintendent of the Florence Iron Works, Florence, N. J., has resigned to become cashier of the Florence bank.

The Asbestos Protected Metal Co. announces that Mr. William H. Cummings, formerly of Providence, R. I., has become associated with its Waugh glazing department.

J. G. Buckeye has resigned his position with the Buckeye Machine Co., Ltd., Calgary, Alta., effective Oct. 1, and expects to engage in business for himself.

Charles V. Bower has resigned as general manager of the Trenton plant of the National Radiator Co. William S. Stiles has been selected to succeed him.

Adam H. Lintz, formerly chief safety engineer, Pittsburgh district, American Steel & Wire Co., has been promoted to a position on the engineering staff of the by-product coke department, Cleveland.

Guy Hutchinson, secretary and treasurer of the Hart & Hutchinson Co., New Britain, Conn., of which he was one of the organizers, has resigned and will locate in New York city.

Joseph P. Pinney, for 17 years purchasing agent of the Kilbourne & Jacobs Co., Columbus, O., has resigned effective Oct. 1, to accept the position of assistant secretary-treasurer of the Joseph Schonthal Iron Co., Columbus.

Otto Kafka, who has been general sales manager and more recently secretary of the American Steel Export Co., Woolworth building, New York, has resigned and has become identified in official capacity with the Vulcan Trading Co., Equitable building, New York.

Frank F. Dresser, Worcester, Mass., counsel for the American Steel & Wire Co., will read a paper on "Health Insurance" at the 15th annual convention of the National Machine Tool Builders' association at Hotel Astor, New York city, Oct. 24 and 25.

James G. Brown, Yokohama, Japan, manager of the Shanghai and Tokio branches of the Superior Export Co., New York city, is visiting machine tool manufacturers in New England. He will visit cities in the middle west before returning to Japan in November.

James Gayley, formerly vice president of the United States Steel Corporation, is the president of the newly-organized Alaska Mines Corporation, in which several iron and steel men are interested. T. I. Crane of Pilling & Crane, Philadelphia, and August Heekseher, director of the Eastern Steel Co., are directors.

George Durham, Hackettstown, N. J., master mechanic for the Delaware, Lackawanna & Western railroad for the past six years has resigned to become superintendent of the Wheeling & Lake Erie railroad. Mr. Durham will be located at Brewster. F. H. Reagan, superintendent of shops of the Lackawanna, will become master mechanic.

J. E. Dailey, formerly with the Brier Hill Steel Co., and more recently with the Algoma Steel Co. at its Sault Ste. Marie works, has just been appointed superintendent of the Youngstown Iron & Steel Co.'s open hearth plant, vice Archibald Smith, resigned. The change will become effective about Oct. 1.

Patrick Mullen, mine inspector of the H. C. Frick Coke Co., with headquarters at Scottdale, Pa., talked about "New Mining Methods as Practiced by the H. C. Frick Coke Co." at the monthly meeting of the Metallurgical and Mining section of the Engineers' Society of Western Pennsylvania, Sept. 26.

Jacob D. Waddell has been elected president of the Mahoning Valley Steel Co., Niles, O. Other officers are Thomas E. Thomas, vice president and treasurer, and W. Aubrey Thomas, secretary. The company was recently incorporated to erect an 8-mill sheet steel plant at Niles. Mr. Waddell was for some years connected with the Republic Iron & Steel Co., the American Sheet & Tin Plate Co. and the Brier Hill Steel Co. and resigned as sales manager of the last named company early in the present year to promote his new enterprise.

E. L. McGrew, purchasing agent of the Standard Underground Cable Co., Pittsburgh, was elected president of the National Association of Purchasing Agents at the annual convention of that society held in New York City recently. E. H. Ridgway, purchasing agent of the Colonial Steel Co., Pittsburgh, was elected treasurer. Robert McMillan, Pittsburgh Steel Co., Pittsburgh, and J. H. Robinson, of the United States Bureau of Mines, Pittsburgh, were elected directors of the association.

S. R. Willock has been appointed general manager of sales of the William Tod Co., Youngstown, to succeed R. D. Day, who resigned recently to become connected with the Pollak Steel Co., Cincinnati. Mr. Willock for some time past has been assistant general manager of sales. He graduated in 1905 with a degree of mechanical engineer from the Western University of Pennsylvania, now the University of Pittsburgh, and since that time has held the following positions: Westinghouse Machine Co. of Pittsburgh, erecting engineer, steam turbine department; Heyl & Patterson Co., Pittsburgh, engineering department; Mesta Machine Co., Pittsburgh, sales engineer; Treadwell Engineering Co., New York and Easton, Pa., sales manager. He has been with the William Tod Co. since June 1, 1915.

W. R. Donaldson has been appointed special agent for the United States Steel Corporation, having complete charge of the slag sales department, with headquarters in Pittsburgh, effective Oct. 1. Mr. Donaldson has been connected with the corporation for the last 13 years, working his way up from a clerkship. At the present time, he is superintendent of transportation and labor and also supervises the sales action of the commercial slag department of the Carnegie Steel Co., in the Youngstown district. William Griffin, chief of the safety department of the Carnegie company in the Youngstown district, will succeed Mr. Donaldson as superintendent of transportation and labor and George Davis, formerly head of the Carnegie Steel Co. at Sharon, and later with the Midvale Steel & Ordance Co., at Midvale, Pa., succeeds Mr. Griffin.

Car Buyers

Are Active in the West—Many Inquiries Pending

Chicago, Sept. 26. — An unusual effort to obtain new rolling stock is being made by railroads generally. There is more inquiry at present than usual and a number of sales have been made recently. The Chicago & Alton is inquiring for 200 automobile cars, the Seaboard Air Line for 100 stock cars, the Pere Marquette for 1,000 box cars, the Chesapeake & Ohio for 1,000 hopper cars, the Missouri Pacific for 2,000 general service cars, the Western Maryland 2,000 steel hoppers, the Wheeling & Lake Erie for 500 to 1,500 flat cars and 500 hoppers, and the Armour Car Lines for 300 center underframes. The latter will also build 300 refrigerator cars in its own shops.

The New York, Chicago & St. Louis railroad has bought 500 steel center frames from The Ryan Car Co., and the Western Pacific railroad has ordered 1,000 box cars and 150 stock cars from the Mt. Vernon Car Co. The Bethlehem Steel Co. has bought 30 coke cars from the Pressed Steel Car Co. and is inquiring for 150 ore cars.

Colliers for Panama

The Panama canal will, at an early date, issue specifications and call for bids for the construction of two colliers equipped with self-discharging gear, which were authorized by congress, fixing the limit of cost at $1,500,000 each.

These colliers are to be essentially a duplication of the colliers ULYSSES and ACHILLES, constructed by the Maryland Steel Co., bids for which were called for under plans and specifications prepared by the navy department, issued in January, 1914.

Sweeping Order

Judge Jabez Fox, of the Massachusetts superior court, recently issued what is considered to be one of the most drastic orders of its kind ever made against a labor organization in that state. He ordered an injunction to issue against Local 7 of the housesmiths' and bridgemen's union enjoining it from enforcing votes of the union of Feb. 28 and April 10 last, whereby fines and penalties were imposed upon six members who remained in the employ of the W. A. Snow Iron Works, Chelsea, which company is completing a contract to furnish structural, wrought and ornamental iron work for the west wing of the state house. Judge Fox also decreed that the members of the union shall not combine to prevent the company from finishing its work or from taking any steps which may bring about a sympathetic strike, or from circulating reports that the company is upon the unfair list. The order of the court also provides that the members of the union may return to the employ of the Snow Iron Works without fear of fine or penalty. It is based on a finding by a master in chancery who held that a strike ordered by the union was unjustifiable and illegal.

Bids Rejected

Bids received by the village council of Highland Park, Mich., for the construction of a 40,000,000-gallon reservoir were rejected as being much too high. Prof. W. C. Hoad, of Ann Arbor, who was engaged by the village as engineer, says that the village can do the work at a saving of $80,000. The highest bid received was $250,000 and the lowest $182,000. Bids will be re-advertised. The bids submitted for the construction of a filtration plant were also considered too high but the council will not re-advertise for bids till spring.

Houses Needed

The report of the special committee, appointed by the board of commerce of Flint, Mich., to investigate housing conditions in the city, states that immediate erection of at least 5,000 houses is a necessity for the families of workingmen and should be rented or sold at a moderate price. Another aim of the board will be to secure a housing ordinance to cover the needs of a city of 150,000 population. It is also planned to upbuild the city on a scientific plan.

The Carnegie Steel Co., Pittsburgh, has completed plans for doubling the capacity of its iron ore briquetting plant at Homestead, Pa. The company has immense tonnages of ore dust on its yards. An additional open hearth furnace at the Homestead plant of the company will be equipped for the use of powered coal. Experiments are being made by the company for burning coal tar in an open hearth furnace.

Hoadley in Contempt

Edward S. Murphy and Thomas J. Higgins, both of Bridgeport, Conn., have been appointed receivers of the American & British Mfg. Co., in that state, and its former president, Joseph H. Hoadley, has been restrained from disposing of about $500,000 in notes and assets of the company. He has also been adjudged in contempt of court for failing to comply with its orders concerning a judgment for $13,557 obtained by Richardson, Hill & Co., Joseph R. Truesdale being appointed referee to assess the amount of damages suffered by the plaintiffs.

Catalogs Requested.—The Simplex Machine Tool Co., Hamilton, O., desires to obtain for its purchasing department a new set of supply catalogs, such as are used in the manufacture of machine tools.

The Jones & Laughlin Steel Co., Pittsburgh, has put into operation one of its two butt weld furnaces at Woodlawn, Pa. When the new plant is completed, it will house two butt weld furnaces and two lap weld furnaces for the manufacture of steel pipe.

The 22-inch mill of the Bethlehem Steel Co.'s new merchant mill layout broke its monthly record by producing 9,180 tons during August, as compared with 8,160 tons during May, of this year.

The Non-Ferrous Metals

Copper **Lead** **Spelter** **Tin**

New York, Sept. 26.—The metal markets generally are rather quiet. Renewed fair demand for copper is coming out from domestic consumers. Prompt supplies of electrolytic copper appear to be in better volume. Electrolytic is quoted as follows: Prompt and September, 28.50c to 29c; October, 28.37½c to 28.75c; November and December, 27.87½c to 28.25c. Prime lake quotations are: Prompt and September, 28.12½c to 28.62½c; October, 28c to 28.50c; November and December, 27.75c to 28.25c. Casting copper is quoted 26.12½c to 26.62½c.

The lead market is quiet but firm owing to the scarcity of offerings. Very little metal is obtainable for delivery before November. One large producer estimates October supplies at one-fifth what they usually are. Lead prices are unchanged.

A little greater activity is evident in spelter chiefly from galvanizers, but buying as a whole is small. Prime western is quoted 8.87½c to 9c for prompt delivery.

Canadian inquiries still feature the antimony market. A fair amount of business is being placed. Leading Chinese producers are out of the market on nearby antimony. Domestic antimony, spot, is quoted 11.50c to 12.25c.

(*For complete prices see page 662.*)

Tests of Track Bolts and Wrenches

A Series of Experiments on Wrenches to Determine Their Maximum Efficiency Developed Several Striking Facts Concerning Track Bolts—Results From Carbon and Alloy Steel Bolts Are Described

BY EARL STIMSON

WITH the introduction and extensive use of track bolts of large diameter, and of bolts made of high tensile steels, the necessity of a greater length of track wrench became apparent. This led to some experiments to develop the maximum length of wrench for practical and safe use, several interesting facts being brought out regarding the behavior of bolts of different diameters and of different tensile strengths.

Tests Made on Riehle Machine

Two tests were made: First, using standard 1-inch x 4¾-inch carbon steel bolts with Harvey grip thread and hexagonal nuts, and second, using 1-inch x 4¾-inch heat treated alloy steel bolts with U. S. standard thread and hexagonal nuts. The bolts were tested in a Riehle screw gear 100,000-pound machine equipped with apparatus designed especially for testing bolts, as shown in Fig. 1. After placing the bolt in the loop, the movable head of the machine was run up far enough so as to permit placing the bea.ing plate and spring washer a full thread in the nut, which was then at such a height as would enable a man to get a horizontal pull at his waist line. After measuring each bolt and recording its dimensions, a trackman weighing 150 pounds was given a wrench and directed to tighten the nut as he would in the track, the resultant loads being observed on the scale beam. After he had drawn the nut tight, the load on the bolt as registered on the beam was recorded. The machine was then started on slow motion, about ½-inch per minute, until the elastic limit was reached. This being read and recorded, the machine was run to the ultimate strength of the bolt. A repetition of this test was made, using wrenches 30, 36, 42 and 48 inches in length. The results were then tabulated to show the relation between the load on the bolt when pulled tight with the different wrenches, and the load at the elastic limit of the bolt.

It was intended to make the conditions of the test identical, as nearly as possible, with actual conditions met in maintaining track. It was found difficult, however, to arrange the apparatus so as to get a pull on the wrench in a vertical plane and at the same time measure the loads accurately. The arrangement enabled the trackman to throw his entire weight on the wrench, giving it about the same jerk or impulse it receives in actual practice. No attempt was made to obtain uniformity of load with the same length of wrench; the trackman used his own judgment in determining when the nuts were tight. The loads on the bolts, therefore, when the nuts were pulled up tight, were shown to vary as much as 8,000 pounds for the same length of wrench.

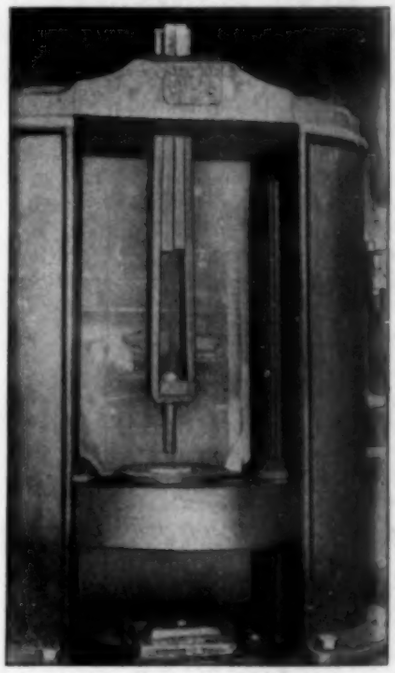


FIG. 1—APPARATUS USED FOR TESTING TRACK BOLTS

Properties of Material Tested

Fig. 2 gives the dimensions of the bolts. In the run of the kegs the carbon steel bolts averaged 0.995 inch, in diameter while the heat treated alloy steel bolts run about 0.933-inch in diameter. The threads of the carbon bolts were of the Harvey grip pattern, while those of the heat-treated alloy bolts were of the U. S. standard pattern, both being rolled.

A comparison of the chemical and physical properties of the two bolts is as follows:

Elements.	Carbon steel. Bolts. Per cent.	Carbon steel. Nuts. Per cent.	Alloy steel. Bolts. Per cent.	Alloy steel. Nuts. Per cent.
Carbon	0.20	0.12	0.19	0.17
Sulphur	0.031	0.09	0.037	0.08
Phosphorus	0.008	0.110	0.01	0.073
Manganese	0.50	0.37	0.71	0.60
Chromium	....	....	0.14	0.08
Nickel	....	....	1.09	0.41

	Carbon steel.	Alloy steel.
Reduction, per cent.....	46.7	30.5
Elongation, per cent in 4¾ in.	15.3	7.8
Elastic limit, lbs. per sq. in..	49,109	93,225
Ultimate strength per sq. in..	59,704	104,793

The trouble experienced with the corners of hexagonal nuts rounding while being tightened, gave rise to an examination of the nuts, as well as the bolts. The analysis of both kinds of steel showed higher carbon and manganese in the bolt than in the nut, while the sulphur and phosphorus ran lower in the bolt than in the nut. The function of these elements in the bolts is to bring up the tensile strength of a comparatively low carbon steel. Their presence in the nut likewise improves the quality of the metal.

Purpose of Investigation

The object of the tests was to show the relation between the loads on the bolts when drawn up tight with various length wrenches and the elastic limit of the bolts. The averages of a series of tests with carbon steel bolts shows the loads pulled with 30-inch and 36-inch wrenches to be well within the elastic limit of the bolt, while the load pulled with the 42-inch wrench exceeds the elastic limit. The load pulled with the 48-inch wrench is less than that pulled with the 42-inch wrench, and is also less than the elastic limit of the bolt. The increment of load should be expected to vary with the length of wrench. In running this test, however, the jaws of the 42-inch and 48-inch wrenches became so badly sprung that the nuts rounded so as to prevent pulling them up tight. Figs. 3 and 4 show the bolts after the test.

The 48-inch wrench was re-dressed and tempered and another series of tests made. Again its jaws sprung, and so damaged the nut that further

From a bulletin published by the American Railway Engineering Association. The author is engineer, maintenance of way, Baltimore & Ohio Railroad.

tightening was impossible. With the carbon steel bolts and hexagonal nuts, therefore, the use of a wrench greater than 36 inches in length not only involves the risk of stretching the bolts beyond their elastic limit, but so injures the nuts as to necessitate cutting them in order that they may be removed.

Trouble with the wrenches spreading was not experienced with the alloy steel bolts. After a second dressing and tempering of the same wrenches used with the carbon steel bolts, a much greater load was pulled, using alloy steel bolts, without injuring the nuts.

Here it should be remembered that the nickel and chromium elements in the alloy steel produce a much harder steel than the mild open hearth carbon steel, without raising the carbon. The need of a harder steel nut is emphasized by the damage done with long wrenches while tightening the carbon steel bolts. Slightly greater loads were pulled, with the same length of wrench, with the alloy bolts than with the carbon bolts, while the damage done to the nuts, as shown in Figs. 3 and 4 was much less with the alloy steel than with the carbon steel.

The loads which were registered when the nuts were pulled up tight vary considerably. Several factors account for this variation. In the first place, it was left entirely to the trackman pulling the wrench to determine when he had the nuts tight; second, the damage done by the wrench to some of the nuts was greater than to others, making it impossible for the trackman to draw all of them up the full amount; and third, the Harvey grip thread on the carbon bolts pulled much harder than the U. S. standard thread on the alloy bolts. The Harvey grip threads on the bolts run eight to the inch, while those in the nut run about 7.8 to the inch. They are rolled to fit loosely, so that the first three turns of the nut can be made with the fingers. The difference in pitch of the threads then takes effect, giving a much tighter nut than when threaded with the same pitch as the bolt. Futhermore, the Harvey grip threads pulled much more irregularly than the U. S. standard threads, as in some cases the nuts with the Harvey grip threads could be turned down the full length of the thread with a 12-inch wrench, while others required a 30-inch wrench with considerable pull to screw them down when the bolt was clamped in a vise. The strength of the bolts is calculated on the basis of minimum allowable elastic limit of the steel, namely, 48,000 pounds per square inch for carbon steel and 75,000 pounds per square inch for alloy steel

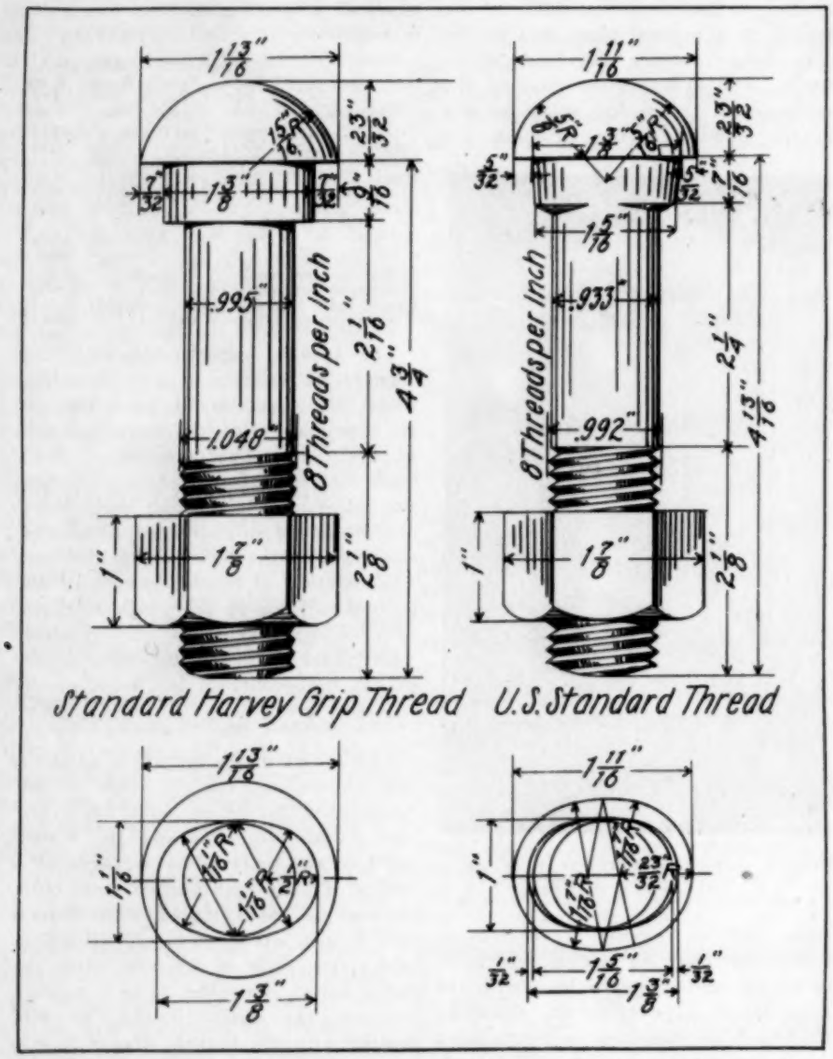


FIG. 2—DIMENSIONS OF HARVEY GRIP AND U. S. STANDARD THREAD TRACK BOLTS USED IN TESTS

Unequal Tension on Bolts

To secure the greatest efficiency in the rail joint, it is essential that the splices be held together rigidly. This is the primary function of the bolts and, to obtain proper rigidity, sufficient tension must be put into them so that there will be no separation of the splices under load. It seldom happens that all bolts are tightened the same amount, consequently a large percentage of the load transmitted through the joint comes in tension upon the bolts that are tightest. Undoubtedly the maximum condition is when the two middle bolts are the tightest. Taking for example an axle load of 64,000 pounds, one wheel would impact to the rail joint a static load of 32,000 pounds. Assuming that the effect of impact adds 200 per cent to the static load, there would be 96,000 pounds coming to the rail joint. Each of these two middle bolts would then receive one-half the horizontal component of 96,000 pounds acting upon the wedging surface of the splice bars, namely, 21,043 pounds.

Therefore, to take care of the loads coming to a joint, the bolts should be tightened to a tension of at least 21,043 pounds. But, in practice, 21,043 pounds of tension is not sufficient to overcome the rough bearing surface between the splices and rail, so that it becomes desirable to bring much greater tension in the bolts to take care of the ununiform bearing faces and to insure the maintenance 21,000 pounds as a minimum stress in the bolt.

When a bolt has been wrenched up to 21,000 pounds tension and subsequently receives a strain of 21,000 pounds from rolling loads, it must

withstand a total of 42,000 pounds tension.

A 1-inch bolt of 75,000 pounds per square inch elastic limit withstands only, say, 59,000 pounds, so that the difference, namely, 17,000 pounds, represents the allowable greater tension that can be wrenched into the 1-inch bolt, making a total of 21,000 pounds plus 17,000, or 38,000 pounds.

Many complaints have been made that the metal in the jaws of some wrenches is too soft, which permits the jaws to spread, rendering them useless. This trouble has been experienced largely where hexagonal nuts were used. In making the bolt test, it was observed that, unless the wrench was given a full bite on the nut each time, it slipped and the nut gradually rounded and acted as a wedge to open up the jaws of the wrench. A repetition of this slipping soon damaged the wrench beyond further use. As previously stated, one of the long wrenches which spread was redressed and tempered, yet after tightening about half a dozen more nuts the jaws again spread in the same way. When again dressed and tempered, and used with the hexagonal nuts on the alloy steel bolts, there was little trouble with the jaws spreading. These nuts ran a little higher in carbon and contained some nickel and chromium which made them harder. It is believed, therefore, that a great deal of the trouble which is ordinarily attributed to the wrench is due as well to the soft metal in the nut. It is also due to the shape of the nut. Square nuts made of the same quality of steel seldom become so rounded that they cannot be turned, even after the jaws of the wrench have been slightly sprung. The use of hexagonal nuts became necessary in the development of heavy, reinforced splice bars, as the reinforcing ribs so diminished the clearance on the outside surface of the bars that square nuts could not be used. This is now being overcome by the use of thicker spring-washer nutlocks and chamfered nuts.

Results of Tests on Bolts

Load Registered With Nuts Pulled Tight.

Length of wrench, inches.	Harvey grip thread, pounds.	U. S. Standard thread, pounds.
30	26,850	27,300
	23,600	27,770
	26,900	31,200
	Maximum 31,200 lbs.	
36	31,600	34,360
	23,500	29,700
	29,850	28,450
	Maximum 34,360 lbs.	
42	42,600	34,920
	38,650	33,100
	34,600	33,000
	Maximum 42,600 lbs.	
48	35,700	46,350
	25,690	44,100
	33,200	38,700
	Maximum 46,350 lbs.	

Calculated Strength of Bolts Based on Minimum Elastic Limit of 48,000 Pounds per Square Inch for Carbon Steel and 75,000 Pounds per Square Inch for Alloy Steel.

Diameter of bolts, inches.	Area.	Strength in pounds. (Elastic limit.) Carbon steel pounds.	Alloy steel pounds.
¾	0.4417	21,201	33,127
⅞	0.6013	28,862	45,097
1	0.7854	37,699	58,905
1⅛	0.9940	47,712	74,550
1¼	1.2272	58,905	92,040

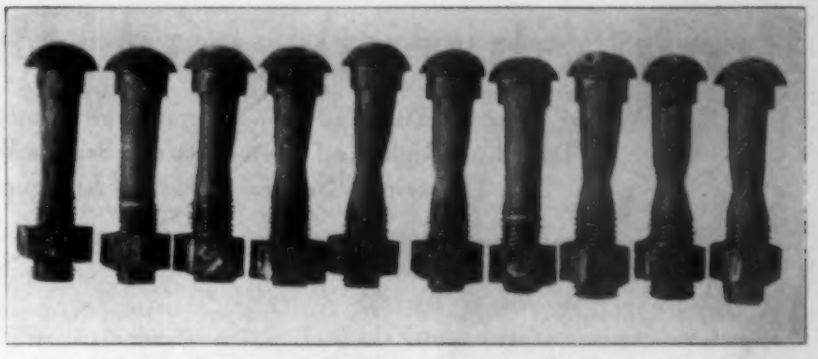


FIG. 3—CARBON STEEL BOLTS BROKEN IN THE SHANK AS A RESULT OF THE TEST

Much Scrap Recovered

The value of the copper, lead, zinc, tin, aluminum and antimony recovered in the United States from scrap metals, skimmings and drosses in 1915 was $114,304,930, against $57,039,706 in 1914, a 100 per cent increase. This large gain was caused by greater recoveries and much higher average values for all metals.

The increased output of secondary tin, lead and aluminum, says a statement issued by the United States geological survey, was normally to be expected under the improved conditions of business, and the proportionally larger increase in the recoveries of zinc, copper and antimony were due in part to the foreign demand for pig metal or for manufactured goods containing the metals named.

The output of secondary copper, including that in brass and other alloys, was 196,000 tons in 1915 against 128,000 tons in 1914. The value of this copper and brass amounted to more than $70,000,000.

The secondary lead recovered in 1915, including that in alloys, was nearly 79,000 tons, an increase of 28,000 tons, a quantity exceeded by the primary domestic output of only three states—Missouri, Idaho and Utah.

The amount of secondary zinc recovered in 1915 was 92,575 tons, of which 29,764 tons were recovered by redistillation from drosses and skimmings. At least 4,000 tons of zinc chloride and 46,000 tons of lithopone were manufactured. The zinc used in these products is derived mainly from zinc drosses and skimmings.

The output of secondary tin increased from 12,447 tons in 1914 to 13,650 tons in 1915 and was equal to 24 per cent of the tin imported as metal or as oxide into the United States.

The average price of antimony was abnormally high and the secondary recoveries in 1915 amounted to 3,102 tons, valued at $1,811,568, an increase in quantity of 355 tons, and in value of about $1,367,000.

Aluminum was both scarce and very high priced the latter part of 1915 and the secondary metal recovered, 8,500 tons was valued at $5,802,000.

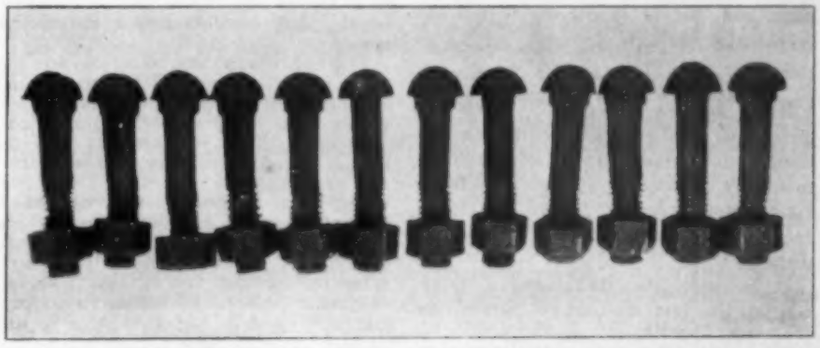


FIG. 4—ALLOY STEEL BOLTS SHOWING BREAKAGE AT ROOT OF THREAD

Profit-Sharing and Preparedness

The Author Believes That Individual Attainment, Judged by Motion Study and Based on Right and Justice, is the Proper Basis for Profit-Sharing—Several Schemes Are Suggested

BY C. E. KNOEPPEL

IN ALL of our discussions of the important question of industrial preparedness, there has been little said with reference to *adequate incentives.* In an address before the Academy of Political Science of New York on "Compulsory Service and Industrial Preparedness", I stated that compulsory service ceases to be compulsory when there is a desire and a willingness to serve and that our problem was to find out how to induce this willingness and desire. Likewise in industrial activities, this willingness and desire must be induced—*it cannot be forced*—and to do this, incentives in some form must be devised and provided.

A worker laughs when he hears someone speak of the joy of work. In business, however, men will work for 16 hours a day if it is found necessary. For the love of the game? Yes, to some extent because to play the game is essential to success, but the real reason is the incentives behind it all, warranting concentration and hard work for long hours.

A worker goes home at night and he has earned a day's wages. Tomorrow is another day and he will earn another day's wages—if he is not discharged or laid off; if he does not quit; if he does not die or is not taken sick. His life is a by-the-day proposition. Of course this is conducive to freedom from worry, contentment, an optimistic attitude and the like. On the other hand, the business man or executive goes home at night knowing that tomorrow, next week, next year, he has something to work for—*his business.* He may be worried because of business conditions; things may not be breaking just right but he feels that this is all part of the game and that he is playing with what is actually his.

Incentives and Lack of Them

No, I am not a Socialist. I am not advocating an equal distribution of things, nor giving away of anything that isn't warranted by the conditions. I am simply trying to picture the difference between incentives and the lack of them.

In industry the manufactured product, in the last analysis, is labor, for the material that is bought by one concern and processed by labor, represents the labor spent on other material by another concern, and so on through to basic processes. With this thought in mind it should stand to reason that the man who serves his employer best is the one—

1—Who works efficiently rather than strenuously.
2—Who is not forced nor driven.
3—Who has faith in the management.
4—Who is not treated in the manner that induces worry and doubt regarding the future.
5—Who does not have to shoulder responsibility that rightly belongs to the management.
6—Who knows that the question of exertion and fatigue receives due consideration by the management.
7—Who works under the right working conditions.
8—Who realizes that the management is interested in his welfare.
9—Who works in a pleasant, congenial atmosphere.
10—Who receives something in addition to wages for time spent at work, which represents, to him, his skill, cooperation and extra efforts.

These are real incentives and until the time comes when they are all provided, there will not be the right relationship between capital and labor.

Business is conducted for profit. Material is purchased and brains and muscle are utilized in converting this material through the medium of plant and equipment, into a finished product at a cost that will be less than the price secured. The material, plant and equipment represent an investment. Inasmuch as it is impossible to get results from the capital investment without the human investment, these conclusions seem logical:

1—That capital investment is entitled to a fair return on the amount invested in the form of interest for the use of money.
2—That brains and muscles are entitled to a fair return for the efforts expended, in the form of salaries and wages.
3—That after the capital and the human investments have received their fair returns, the balance, after providing for contingencies, depreciation, bad debts and the like, should be divided between both capital and human investments, on some basis that represents the reward for results, both investments were instrumental in securing.

You say this means profit-sharing. Let us look at it as saving-sharing, for profit-sharing on the right basis should induce the desire to effect savings which would be divided between capital and human investments.

You say, "Suppose there are no profits or savings to divide?" My answer is that proper methods and the desire to share in the savings will, in the majority of cases, lead to savings to share.

Let us not look at this subject, however, without considering the thorny side of things. In a survey made by the welfare department of the National Civic Federation, it was found that of the companies whose plans were analyzed, *almost one-third were successful and the balance failures,* which would seem to indicate that no further thought should be given to the matter.

Let me paint you a few pictures before passing judgment, in an effort to determine a real basis for profit-sharing.

Evils of Equal Division

Two molders are working side by side, each drawing the same wages, we will say, and both in the employ of the company for about the same length of time. One of them is a careful, painstaking and conscientious man, who gives his employer the best he has, his contribution being maximum production with a minimum of rejections. The other is not so careful nor painstaking, nor conscientious, putting up only enough work each day to get by and while having scrap from day to day, does not have so much as to cause his dismissal. The one displays interest in his work. The other doesn't. The one does his best; the other believes in doing no more than he has to. Dividing profits or savings beween these men gives them an equal amount and the effect is detrimental to both. The conscientious man smarts under what he feels is an injustice in that he gets no more than the other man, for even though he says nothing about it, he knows in his own heart that he has earned more for the company than the other and consequently feels that his share should be greater. The man not so conscientious knows that he has, without exerting himself, to the same extent as his fellow workman, secured as much in the sharing, and naturally feels that there is no need for him to do his best. The result is that both

A paper presented at the annual meeting of the American Foundrymen's Association, Cleveland, Sept. 11 to 15, 1916.

say—"What's the use?" This establishes an important law as I see things—*sharing in savings or in profits should be in proportion to individual attainment.*

Now for another point. The worker is a by-the-day thinker, for all his life he has worked from day to day, getting his money from week to week or twice each month. He lives in the immediate as far as his work life is concerned. The purpose of saving or profit-sharing is to induce interest, foster a desire to do the best that is possible and to get the worker to take every advantage of his opportunities and the facilities furnished him. People are prone to count their chickens before they are hatched but if the hatching is too far in the future, they quit counting. So with workers. They will work for savings or profits if the division is more or less immediate, but if you attempt to keep them interested on the basis of promises that will not materialize for six months, you will find their interest on the wane and again the result is—"What's the use?" This establishes another law—*profits or savings should be shared at such frequent intervals as will insure interest being maintained.*

Another point has a bearing on this important question. Men are working under a profit-sharing plan. They are expecting that there will be profits to divide and then, we will say, due to a bad year the earnings are insufficient to warrant sharing them with the workers. Now imagine the feeling of a worker trying to do his best, realizing that he has given his employer the best of service which should, as he sees things, entitle him to something above his wages, suddenly confronted with the situation which he expresses as "nothing doing". Again the result is —"What's the use?" This situation, to my mind, establishes still another law—*something should be given to the worker regardless of the company showing in return for the interest and effort expended in anticipation of sharing in profits.*

What's the Use?

Still another point. Workers may share in the profits or savings made, but if they see evidences of extravagance, of carelessness, of waste on the part of the management; of factors they cannot control like bad debts, buying at high prices due to faulty purchasing, faulty selling, inefficient equipment, poor working conditions, faulty methods, you are confronted with the same condition —"What's the use?" This establishes the fourth law—*savings or profit-sharing should be on the basis of factors within the worker's control.*

There are, of course, other points that can easily contribute to the failure of a plan of profit or savings sharing, as for instance—

1—The attitude of organized labor.
2—The fear of over-production and the introduction of machinery.
3—Suspicion on the part of labor as regards motives and intent.
4—Failure to properly understand the plan in use.
5—No say in determining the plan by labor.
6—No way of determining that the profits are as stated by the management.

I believe, however, that if the four laws are recognized and lived up to, the plan that may be decided upon can be made successful in the majority of cases.

Let us restate these four laws and see what can be done towards working out a plan based on a conformance to them:

1—Sharing should be in proportion to individual attainment.
2—Frequent intervals in dividing.
3—Division regardless of company showing.
4—Division should be on items within the workers' control.

But you say—how are we to determine individual attainments? How can we divide savings or profits when we only know once or twice a year what our real condition is? If we suffer a loss we have to stand it, why shouldn't the men? Why should we give men a division on items only within their control, when our real showing is on all the items which influence profits and savings?

These are fair questions and demand consideration. In attempting to do this let me give you a fundamental principle:

Unless the plan you establish is based on right and justice; unless there is something of the give and take to it; unless there is co-operation between the men and the management in working things out; unless the men can feel that they have some say in it all, by all means save your energy and your money, for unless this fundamental is considered, the plan is doomed to be a failure before it is even put in operation. Remember that two-thirds of the plans have proved failures and what you install must be on such a basis as will insure success at the outset.

Let us consider the laws in logical order:

Much has been written and said about individual attainment, but I contend and my experience has shown that standards can be set that will determine the efficiency of each man, such as molder or coremaker, or groups of men, such as cleaners or laborers. Where they cannot be accurately or scientifically set, fair estimates can be made, not by looking at a pattern and saying, "Oh, this will take about five hours," but by setting down the known elements and estimating the time for each element as indicated by the following:

Operation—Estimated Time, Minutes
Laying board and pattern.
Placing drag.
Riddling sand.
Shoveling heap sand.
Ramming drag.
Laying bottom-board.
Clamping and rolling.
Placing cope side of pattern.
Placing cope.
Placing gaggers.
Ramming cope.
Lifting cope.
Finishing mold.
Filing, setting and securing cores.
Closing.
Clamping and placing weights.
Total allowance.
Grand total.

It is obvious that a concern that does not know its exact condition until the end of the year, cannot, of course, divide savings or profits at frequent intervals during the year. The fact remains, however, that the accounting and cost systems can and should be arranged on the basis that would enable the management to secure monthly profit and loss statements, from which it could be determined what had been saved in reduced costs or made in profits. Even if no monthly payment was made to the men they could be advised regarding the showing, along with an idea regarding what they would make and the payment made every three months, or at least twice each year. The knowledge that they had earned something with an idea regarding the amount would do much to keep the interest of the men at the right point.

Rewards Regardless of Company Showing

It wants to be remembered that all the men have to look forward to is their wages, which they, of course, receive regardless of any loss the company may sustain. At the same time the owners of the company have the future to look forward to. They own the business, the investment is theirs and losses sustained at one time may be made up at another time. They can borrow money; the men cannot. They may have a surplus. The men haven't. They may have a reserve capital which the men do not possess. After all, the big thing is to secure the co-operation of the men and a striving for rewards and their not getting them will do more than any other one thing to make them lose heart and say—"What's the use?" Some provision should be made to let the men share in some form of reward, regardless of the company showing.

You can well imagine the effect on the average worker's mind, of doing sufficiently well on things within his control to entitle him to rewards only to lose them because of what happens to items not within his control. The men can't and should not run a business. They are engaged to do certain

definite things and the idea of giving them a share in savings or profits is to get them to do their best with reference to these certain, definite things. The men might do their part of the work, but because of poor purchasing, or inaccurate costing, or other causes, losses would wipe out the gains the men ought to make. It seems, because the men are not to blame for the losses and because they have done what would otherwise entitle them to rewards on the items they could and did control, that they should be rewarded.

Some years ago in a shop paying their men on the bonus plan, some men were delayed, due to causes beyond their control. The time set, we will say, was 10 hours, and that the men did their part of it in 10 hours, but because of the delays of two hours the total time was 12 hours, or an efficiency of 83.3 per cent. Should the men stand this delay or should they receive their reward and the efficiency be charged to the management?

Suggested Plan

Under any plan of profit or savings-sharing, the regular wages paid to the men in the district should be paid to the men working under the plan.

To base the rewards on individual attainment, fair standards should be determined by motion study or estimates based on detailed analysis and a sliding scale should be paid the men over and above their wages based on their attainment as follows:

Per cent efficiency.	Per cent on wages.
100	20
90	10
80	5
70	2
60	0

As this premium would be paid on what the men actually do, rewarding them as outlined, would take care of the two provisions, rewarding them on items within their control and regardless of the company showing.

After rewarding the men as outlined and after taking care of depreciation, bad debts and reserves and giving capital investment a fair return on the money invested, the balance should be divided between the capital and labor investment. *The amount to be given the men should be paid on wages plus premium.*

If you pay men wages, plus premium or bonus based on individual attainment and on top of this give them an additional amount representing their share of savings or profits, *you have provided real incentives;* for men will then be anxious to do their best, because high efficiency will result in increased wages. Increased wages will mean larger premiums and a large wage and premium total will mean a greater share on the savings or profits given. In arranging to distribute the savings the following could be used to advantage:

Divide the business into departments and charge them with the direct labor costs, indirect labor costs and the proper share of overhead expenses, chargeable to the producing end of the business. Credit these departments either with what the costs were at the time the plan was started, or with fair estimates covering the work done from the standards determined upon. This means that the departments would be charged with actual times or costs and credited with estimated or standard times or costs. The difference would be the savings or waste. Incidentally, the men should have some say in the settling of these estimates or standards if their full and hearty co-operation is to be secured. In case piecework was in operation at the time the plan was introduced, which would naturally have to give way to an hourly base of wage paying, the piecework could be paid, out of the savings, the difference between the day rate and what their hourly rate on piecework was for a period of four to six months previous to the installation of this method of reward.

As can be seen, this, with reference to the business as a whole, is the same kind of a plan as applies to the men in giving them a premium or bonus based on individual attainment. The total actual and standard or estimated times and costs covering all the molders would be the charge and credit for the molding department and the difference would be the waste or saving. The total actual and standard or estimated times of all departments would give the charges and credits for the business as a whole and the difference would be the waste or saving. One-third to one-half of the net savings should be credited to the men and paid to them on the basis of total wage and premium earnings, as before mentioned. Common labor and the foremen should be included in the division.

A Fifty-fifty Split

Another plan, would be after capital has received its legitimate earnings and taken care of contingencies and labor has received its regular wages, any surplus should be divided between the two *in proportion to the earnings made by capital and labor.* If in a business capitalized at $500,000, the earnings amounted to $100,000 in a year and the earnings of labor were $100,000, any surplus should be divided—fifty-fifty—as the saying goes. In other words, after deducting 6 per cent as dividends, $30,000 and $25,000 for contingencies, reserves, etc., or $55,000, the surplus would be $45,000, of which $22,500 would go to labor and the remaining $22,500 to capital. Many other plans could be described, and details outlined, in fact a good sized book could easily be written about profit-sharing. After all, the principles cover far more than methods. If the principles are right, the methods cannot go very far wrong when practically applied.

Book Review

Mechanical Engineers' Handbook, edited by Lionel S. Marks; leather; 1,836 pages, 4½ x 7 inches; published by McGraw-Hill Book Co., and furnished by *The Iron Trade Review* for $5 net.

In the *Mechanical Engineers' Handbook*, the editor, Lionel S. Marks, professor of mechanical engineering, Massachusetts Institute of Technology, has brought together in one volume the work of some 50 specialists, whose names are linked with much that has been written on engineering subjects in this country. In many respects the book is patterned after the *Hutte*, a three-volume German book containing data contributed by a number of mechanical engineers.

The arrangement of the subject matter is much the same as that of other American hand books, mathematics, mechanics, strength of materials, etc., preceding the information relative to the practical application of the theory. Although the book seems to contain a great amount of data asembled in tabular form, it is evident that the author has preferred the text-book style of presenting information. Consequently each subject is introduced with definitions and descriptions of fundamentals, after which comes classification and elaboration of the subject. To assist in grasping at a glance the important parts of paragraphs, catch words which indicate the subject are printed in black-face type. The book is provided with two detailed indices, one of which lists the subjects in the order they appear in the book. The other, which fills over 50 pages, contains an alphabetical list of the contents. As a further help, the book is divided into sections, which are marked by means of thumb tabs. A key to the these tabs appears on the inside and facing pages of the front and back cover, enabling the reader to turn to any major topic almost instantly.

The editing of the vast amount of information contained in the 1,800 pages seems to have been done with a view of sifting out all but important details, but this policy of elimination has not been carried to the point where any subject has suffered from the treatment. In general, considering the fact that the book is in its first edition, it may be said that the authors, co- operating under the leadership of the editor-in-chief have succeeded in establishing a valuable fund of information, which should improve as later editions are published.

The Iron Ores of the Philippines

Four Important Deposits of Iron Ore in the Philippine Islands Are Described —The Natural Advantages of These Ore Bodies Are Many and Extensive Mining Might Prove Profitable

BY WALLACE E. PRATT

IRON ORE deposits in the Philippine Islands became the subject of official record as early as 1664. Undoubtedly iron ore was known and recognized by the Filipinos long before the earliest Spanish records. It is even possible that the Filipino practice of smelting iron ore like the native copper smelting, is older than the Spanish conquest of the islands. With the exception of iron ores on the eastern coast of northern Surigao, the true nature of which was not recognized until 1914, the important iron ore deposits of the Philippines had all been discovered before the islands came under the dominion of the United States.

Today it is recognized that the iron ore deposits in the eastern Cordillera of Luzon constitute, not a continuous belt, but a series of widely separated deposits, including a half dozen ore bodies within a distance of 10 miles in Bulacan Province, a single outcrop at Santa Inez, Rizal Province, farther south, and three deposits around the margin of the Mambulao-Paracale gold mining district in Camarines Province, 100 miles farther to the east-southeast. Other unimportant occurrences of magnetite-hematite ores are known, but the foregoing, together with the lateritic ores in Surigao Province, Mindanao, contain the economically important iron ore reserves of the Philippines.

Magnetite-Hematite Ores

The deposits of magnetite-hematite ores are found in the lower part near the base of the Miocene sedimentaries and along the contact of this series with the older igneous complex upon which it rests. Some of the orebodies are entirely within the older igneous rocks close to the contact. Intrusive rocks are associated with each of the orebodies and penetrate the sedimentaries, the older igneous rocks, and even the ore bodies at places. The sedimentary column is of varying thickness, but usually exceeds 3,000 feet; at the base are breccias, conglomerates and volcanic tuffs enclosing crystalline limestone; these are overlain by shale, subordinate sandstone and tuff sandstone, with two other limestone horizons in the upper part of the series.

Although outcrops of intrusive rocks are abundant near the ore bodies, the exposures are small in area, discontinuous and difficult to delineate. The predominant type of intrusive is felsitic, porphyritic, or holocrystalline in texture and subsiliceous in composition; the rock is dark colored and contains plagioclase feldspar and hornblende or, less commonly, pyroxene as essential minerals. Near one of the ore bodies in Bulacan a siliceous rock is encountered in apparently intrusive relations; in this rock, quartz and feldspar phenocrysts, much cracked and with corroded or ragged outlines, are embedded in a microcrystalline groundmass of quartz and feldspar. The feldspar, both in the phenocrysts and in the groundmass, is principally orthoclase, but plagioclase feldspar is also present here.

OUTLINE MAP OF THE PHILIPPINE ISLANDS SHOWING IRON ORE DEPOSITS. 1—BULACAN ORES; 2—SANTA INEZ ORES; 3—CAMARINES ORES; 4—SURIGAO ORES

The walls of the ore deposits in Bulacan, for a distance equal, roughly, to the thickness of the ore body, consist almost invariably of an altered green rock of uncertain composition. So constant is the association of this wall rock with the ore that the relation is recognized by the native miners, who designate the greenstone as *camisa de bacal*, meaning shirt or cloak of the iron ore. The wall rock is made up principally of amphibole and pyroxene with varying proportions of chlorite and epidote and often some plagioclase feldspar. Frequently the amphibole is fibrous and at many places hand specimens may be secured which consist entirely of either finely or coarsely fibrous amphibole. Adjacent to the ore the wall rock contains magnetite in grains and crystals of pyrite, disseminated and in veinlets with quartz.

The ore bodies usually conform in strike and dip with the sedimentary formation and consist in some cases of replacements of sedimentary beds, especially limestone. The surface dimensions of the outcrops are usually not great, the longest continuous exposure being something over 1,500 feet in length.

Magnetite Predominates

The ore consists of magnetite and hematite in intimate mixture, but in proportions which vary at different outcrops. Magnetite, which is generally predominant, occurs as massive grains and the magnetite ores are usually soft. Hematite may be present only in negligible proportions or may constitute an ore to the practical exclusion of the magnetite. The hematite ores are harder than the magnetite and form resistant outcrops. The hematite is generally massive, but specularite occurs sparingly in nearly all of the deposits. Quartz is an abundant gangue mineral in the leaner ores and near the walls of the ore bodies. It occurs in the interstices between the grains of magnetite and hematite. Eddingfield's microscopic work revealed needles of hematite penetrating the quartz in radiating groups and led him to the conclusion that the two minerals crystallized

An abstract of a paper delivered at a recent meeting of the American Institute of Mining Engineers. The author, Wallace E. Pratt, is chief of the division of mines, bureau of science, Manila, P. I.

from the same solution. Amphibole, chlorite and epidote are found in the ore near the walls. Pyrite is so abundant at places as to be objectionable in smelting but much of the ore, also, is free from pyrite.

Descriptions of Principal Deposits

The largest outcrop of iron ore in Bulacan Province is on the western flank of the Eastern Cordillera about 50 miles north of Manila, in a mountainous, inaccessible, and uninhabited region to which the name Camaching is applied. Camaching, in common with the other ore deposits in Bulacan, is in a heavily forested, broken country which can be entered only along narrow mountain trails. The nearest towns are 10 miles distant, while the railroad is 5 miles farther away. The Camaching deposit is at the head of a small river on a steep westward slope at an elevation of about 1,000 feet. In approaching it from the west along the river, the visitor traverses an extensive series of bedded tuffs and flows which represent the lower part of the Miocene sedimentaries. These beds strike north 20 degrees east and dip to the westward at an angle of about 45 degrees.. The ore body as revealed by its outcrop is 1,500 feet or more in length and from 60 to 200 feet wide in different exposures. The ore is principally magnetite, soft and massive. Quartz and pyrite occur in the ore and in the walls in the usual relations as previously set forth.

Another deposit of iron ore is found at Montamorong, about 4 miles south-southwest of Camaching. The ore body at this place lies on the eastern margin of a lens-shaped area of granite, elongated in a north-south direction but not exposed as far north as Camaching. The Miocene sedimentary series rests directly upon this granite along its western border and is found in patches on the eastern side of the granite, also. Detritus from the granite can be found in the lower beds of the sedimentaries, a condition which establishes the relative age of the two formations. The ore deposit, as revealed by a shallow pit, is a tabular body of magnetite from 3 to 7 feet in thickness. The strike appears to be northwest and the pitch northeast, at an angle of 45 degrees. The ore is soft and massive and contains quartz and considerable pyrite.

About 6 miles south-southwest of Camaching and in line with the strike of the ore body at that place, there are three outcrops of iron ore within a distance of ½ mile, along a north-northest line. These outcrops are exposed in the canons of small streams and while the ore cannot be traced across the intervening ridges and may not persist from one ore body to another, yet the deposits are probably on the same structural line and related in origin. The outcrops are near the eastern margin of the granite area and are themselves flanked on the east by discontinuous exposures of sedimentaries. The strike is uniformly north 15 degrees east, parallel to the strike of the ore bodies, and the dips are steep but are reversed in direction in different exposures.

The northernmost of the three outcrops is on the Constancia mining claim. The outcrop strikes north 15 degrees east and the ore is apparently about 4 feet thick, although it is stated that former exploration revealed a thickness of about 15 feet. The ore is magnetite with considerable pyrite but very little quartz. The Hison outcrop, 1,600 feet south-southwest of Constancia, is opened by a shallow pit, 15 feet wide and 10 feet deep. The floor of the pit is entirely in magnetite and magnetite is exposed in the eastern and southern walls; blocks of magnetite and hematite, likewise, cover the hillside to the south. On the west the pit is bounded by one wall of the deposit, striking north 20 degrees east. The green, altered wall rock is particularly well exposed here, and the ore adjacent to the wall is contaminated slightly with amphibole and chloride. The ore is free from pyrite and contains but little quartz although both of these minerals are found in the walls; in one wall is a small vein of pyritiferous quartz which strikes north 20 degrees east.

About 1,000 feet south-southwest of Hison is the third outcrop, called Santa Lutgarda. It has a tabular form, 15 feet in thickness, and strikes north 15 degrees east with a pitch of 60 degrees to the west. The altered material of the foot wall grades into greenish tuff. The ore is hematite with but very little magnetite and contains more quartz than is present at the adjacent outcrops. The hematite ore from Santa Lutgarda can be distinguished by a slight reddish tinge in contrast with the blue-black color of the magnetite ores.

At Santol, a little more than 2 miles southwest of Santa Lutgarda, large blocks of hematite are encountered over an area 1,000 feet long and 500 feet wide on the lower slope of a hill. The blocks are embedded in residual clay and while many of them weigh, perhaps, 100 tons, no ore in place is to be seen. Both on the east and west, Santol Hill is flanked by sedimentary rocks in which crystalline limestone is prominent. The ore is hematite, generally massive, with but little magnetite, and carries pyrite and much quartz. The blocks of ore appear to be arranged along a northeast line and iron-stained quartz can be traced to the northeast and to the southwest beyond the ends of the ore-strewn belt. The sedimentaries on either side of Santol strike north and dip west.

Titanium Present in Ore

At Tumotulo, within 2 miles to the southwest of Santol, there is an insignificant quantity of iron ore which is interesting because, unlike the other Bulacan ores, it is titaniferous. The ore is found on the slope of a hill entirely within the sedimentary area. Analyses show that the Tumotulo ore contains more than 9 per cent of titanium. There are several other places in Bulacan where small quantities of iron ore are obtained for smelting, but these minor deposits need not be described here.

The Santa Inez iron ore deposit in Rizal Province, east of Manila, is in an area of sedimentary rocks intruded by andesite. The ore body is exposed in a small stream on the face of one of these intrusions. It is not apparent whether or not the ore penetrates the andesite. Crystalline limestone occurs farther upstream lying on the andesite and small veins of iron ore in limestone are to be observed in some of the loose blocks. The ore is principally hematite and is pyritiferous; chalcopyrite accompanies the pyrite in places. Blocks of hematite of many tons weight lie in the stream below the outcrop.

In Camarines Province iron ore is found in sedimentary rocks bordering an area of older peridotite and hornblende-granite. Associated with the iron ore deposits in the base of the sedimentaries are numerous small intrusions of andesite, diorite and gabbro. The largest outcrops of ore are on Calambayanga Island in Mambulao Bay and on the adjacent mainland. Mambulao Bay is a well-known harbor and there is deep water alongside Calambayanga Island so that the ore could be loaded onto ships at a minimum expense.

The island is ¾ mile long and half as much in width and blocks of iron ore, the average dimensions of which vary from 2 to 15 feet, are scattered profusely over its western half, from sea level up to an elevation of more than 200 feet. Along the beach the ore blocks are piled one on another but farther up on the slopes the individual blocks are embedded in the surface clay. Extending into the island

from its southern extremity is a great body of quartz, 200 feet wide and 75 feet high. The quartz is iron-stained and intersecting veinlets of hematite cut through it in many places, while the sedimentary rocks adjacent to it are silicified. Toward the center of the island the quartz outcrop becomes concealed by a mantle of clay and on the northeastern point of the island where it should appear, if it continued so far, large blocks of iron ore are piled high, one on another, over a belt 100 feet or more wide. Shales and standstones, dipping at high angles, outcrop on either side of the ore but several yards to the south along the western shore of the island is a conspicuous dike, 20 feet in width. The dike rock is holocrystalline in texture and consists essentially of plagioclase feldspar and decomposing pyroxene with accessory magnetite. South of the dike, which is vertical and strikes north 60 degrees west, are volcanic tuff and braccia with blocks of ore again in great profusion 200 feet farther south along the beach. There is a deposit of magnetite at the village of Batobolani, the native word for magic stone, magnetite, 7 miles southeast of Calambayanga island. The ore occurs in large blocks embedded in yellowish - brown residual clay and covers an area about 1,200 feet long by 600 feet wide on the side of a hill. Dark-colored crystalline limestone and a subsiliceous holocrystalline rock which Dr. Rinne determined as hornblende-diorite, are found in loose pieces with the ore. The country at Batobolani is made up of intruded sedimentaries near the margin of the older peridotite-granite area.

The chemical analyses in the accompanying table afford an idea of the quality of the magnetite-hematite ores.

These and other analyses show the total iron content to be usually more than 60 per cent. Silica is low in proportion to alumina except where the ore is quartzose, and magnesium oxide is noticeably high relatively to calcium oxide in several ores. Sulphur and phosphorus are usually not objectionably high. Attention has already been directed to the one titaniferous ore from Tumotulo, in Bulacan Province. Traces of cobalt have been detected in pyritiferous portions of some of the ores from Bulacan and it is a common experience to find fragments of cobalt-blue slag on the smelter dumps in that province. The analyses of Bulacan ore are upon samples taken from charges for the native smelters in several cases and probably show slightly more iron and less sulphur than the average ore contains.

It will be obvious that no accurate estimates of quantity can be made for the magnetite-hematite ores. Dalburg and Pratt, basing their estimate solely on outcrop dimensions and assuming that the ore body would continue in depth a distance equal to its least surface dimension, obtained 1,100,000 tons for the Camaching deposit. The other Bulacan deposits probably aggregate at least 100,000 tons. While the assumption as to the persistence of the ore in depth is conservative in view of the character of the mineralization believed to have caused these ore deposits, yet the data available are insufficient to make the estimates reliable. It is possible that the ore will contain a greater proportion of pyrite in depth and, consequently, should not be included in estimates of tonnage, but there is no indication on the surface that pyrite actually increases in depth. Removal of pyrite by oxidation near the surface, which would result in a proportionally greater pyrite content below the oxidized zone, does not appear to have taken place to any important extent. For the deposits of ore in Rizal and Camarines no estimate of quantity can be offered. The Calambayanga deposit appears to be large; probably 100,000 tons are represented in the blocks of ore on the surface.

On the eastern coast of Surigao Province in Mindanao there is an area of about 40 square miles bordering the sea for a distance of 10 miles, which is conspicuously barren of vegetation and is covered with a bright red soil. This condition is the more notable in that the surrounding country is heavily forested and the singular barren appearance of this one section of the coast line has been a subject of interest for years to those who knew of it. But the region is sparsely inhabited and but few boats pass along that coast; consequently it was not until the year 1914, when H. F. Cameron, an engineer who is familiar with the iron ores of the Nipe Bay region in Cuba, made an inspection trip through Surigao that the "Red Hills," as the area in question has been designated on the coast and geodetic charts, were found to be covered with laterite rich enough in iron to constitute an ore. The first analyses of the ore were made in the bureau of science at Manila, and a preliminary survey of the deposit has been made by the division of mines. While there are no regular harbors near the ore deposit, Dahikan Bay, at its southern extremity, is almost landlocked and is perfectly protected in all seasons; its entrance is narrow but the water is deep, ranging from 18 to 28 fathoms within 300 feet of the beach, and the inner bay is abundantly large. Two of the streams that reach the coast within the area covered by iron ore are large enough to afford considerable power, although it is not possible to present a definite estimate in this connection.

The Philippine laterite, or iron ore, is a surface blanket of residual clay varying in thickness up to 60 feet and resting upon the parent rock from which it has been derived by tropical weathering processes. The surface and upper part of this mantle of hydrous iron oxides are brilliant reddish brown in color but at a depth of a few feet the color fades to a yellowish brown that persists downward to a point where the decomposition of the underlying rock is in-

Analyses of Magnetite and Hematite Ores

Constituent.	1	2	3	4	5	6	7
Moisture (100 deg. Cent.)	0.25	0.05	.....	0.07	0.27	1.21	....
Silica	5.02	4.66	43.76	6.84	3.32	9.52	1.02
Alumina	4.80	3.68	2.25	4.13	2.36	5.43	1.31
Ferric oxide	66.41	62.76	40.45	59.09	89.56	65.13	97.35
Ferrous oxide	20.64	27.32	13.50	27.68	4.13	7.89	....
Lime	0.35	0.21	nil.	0.20	0.16	0.38	....
Magnesia	0.74	1.14	.....	1.20	trace	0.58	....
Manganese oxide	0.24	0.08	.....	0.15	0.05	0.38	0.11
Titanium oxide	0.23	trace	.....	0.20	trace	9.31	....
Phosphorus pentoxide	0.12	0.14	.....	0.13	0.08	0.37	....
Sulphur	0.02	0.21	.....	0.21	0.06	0.01	....
Carbon dioxide	1.10	0.30	.....	0.30	0.18	0.53	....
Total	100.32	100.50	99.96	100.13	99.90	99.53	99.79
Iron, metallic	62.54	65.17	38.80	61.71	65.91	51.72	64.14
Phosphorus	0.052	0.061	.....	0.057	0.035	0.161	0.001

1.—Camaching ore, smelter charge.
2.—Hison ore, running sample across face 23 ft. long.
3.—Quartzose ore from Hison.
4.—Montamorong ore, smelter charge.
5.—Santol ore, composite sample of spalls from many blocks.
6.—Tumotulo ore, smelter charge.
7.—Calambayanga ore, average composition of a 500-pound sample.
Analyses Nos. 1 to 6, inclusive, by Forrest B. Beyer, formerly chemist Bureau of Science. Analysis No. 7 by T. Darjuan, chemist, Bureau of Science.

complete. In this zone of incomplete decomposition, which extends upward only 2 or 3 feet from the hard, unchanged rock, the color is pale green or almost white. The ore throughout its thickness is a spongy or mealy clay, but over its surface there are abundant small red concretions, together with occasional rusty porous fragments or crusts of the parent rock.

Composition of Lateritic Iron Ore

In composition the Surigao iron ore appears to be slightly inferior to the ores of the same character in Cuba. The Surigao deposit was sampled by drilling, the material from each 10 feet of hole constituting a separate sample. Thirty-one analyses made in the bureau of science upon material selected as representative of a total of 183 samples, taken at various depths from 89 different holes distributed throughout the ore deposit, show the average dry ore to contain 12.87 per cent water and 47.4 per cent metallic iron. Ore of this character would necessarily be sintered or nodulized before smelting and through the sintering process it would lose part of its water. Kemp observes that the Cuban ore after being sintered contains from 3 to 3.5 per cent of water. If the water in the Surigao ore is reduced to 3.5 per cent by sintering prior to blast furnace treatment the total iron content becomes 52.5 per cent, a figure which may be compared directly with 55.5 per cent for the average sintered Cuban ore. If two conspicuously poor samples, both of which are from the bottoms of drill holes and are probably, therefore, contaminated with the underlying rock, be excluded from the 31 samples chosen as representative, the average iron content of Surigao ore, containing 3.5 per cent of water, is 53.9 per cent.

The results of the sampling tests indicate that the Surigao ore is remarkably uniform in composition throughout the deposit. Of the 31 samples analyzed, 28 show more than 45 per cent, 24 show more than 50 per cent, 12 show more than 55 per cent, and three show more than 60 per cent of metallic iron on the basis of 3.5 per cent water content. Of the three samples containing less than 45 per cent of iron on this basis, two samples might reasonably be discarded because of probable contamination as already explained.

The only detailed analysis of the Surigao ore was performed upon a sample taken from the surface by Mr. Cameron. This analysis showed hygroscopic water, 13.5; combined water, 6.6; silica, 1.04; alumina, 10.56; ferric oxide, 66.8; ferrous oxide, 0.36; and chromium oxide, 1.15 per cent. No nickel oxide was found, but there were traces of sulphur and of phosphorus.

The metallic iron, dried ore, amounted to 54.29 per cent, and deprived of combined water, the metallic iron became 58.2 per cent.

In attempting to ascertain what quantiy of ore is present in the Surigao deposit and what percentage of iron is contained in the average ore, hand drills were employed to determine the thickness of the ore mantle at different places and to secure representative samples of the ore from different depths. The area covered by iron ore is 40 square miles; although it was decided after inspection that about 12 square miles of this area is too distant from the coast and too mountainous to be considered economically important at present, the remaining area is much too large to admit of close sampling in a preliminary study. Consequently, groups of drill holes were placed so as to sample thoroughly small tracts in different parts of the economically important area. In all, 98 drill holes were sunk, admittedly too small a number of tests to establish closely and beyond question the composition and thickness of the ore mantle over an area of 28 square miles; nevertheless, the results obtained are so uniform even in widely separated parts of the deposit that they are believed to indicate, at least roughly, the tonnage and quality of the ore.

Of the 28 square miles of economically important area, only 12 square miles proved to be covered with ore of important thickness. The remaining portions of the deposit are either partly denuded because of the steepness of the slopes or are made up of alluvial-filled valleys in which the ore is contaminated with sand and gravel derived from the parent rock. Drill holes were placed so as to test four widely separated sections of the areas over which the ore mantle is relatively thick and one section in which the ore is thin and discontinuous, the holes in all cases being located at regular intervals, generally at the corners of 1,000-foot squares.

From these figures and the weight of a unit volume of the ore in place it can be calculated that the total economically important metric tonnage is 430,000,000, of which about 375,000,000 tons is contained in that part of the ore mantle which is 10 feet or more in thickness. Reasonably accessible from the coast, but divided into a number of separate deposits by precipitous valleys, there is 275,000,000 tons of ore, with 260,000,000 tons lying 10 feet or more deep. Finally, within two areas of ore which could be mined from a base at Dahikan Bay, the most feasible harbor site, there is 138,000,000 tons, 130,000,000 tons of which is more than 10 feet thick. It should be noted, however, that the bulk of even this most favorably situated ore lies on the tops of hills and broad divides from 400 to 1,000 feet above sea level and that within each of the two areas near Dahikan Bay there are ravines and denuded slopes which would of necessity be avoided in mining.

Origin of Scotch Iron

The origin of many of the terms used in the pig iron and foundry business is buried in the mists of the past. Occasionally a term has come into use within such recent times that it can be traced to its beginning and the facts set down. All foundrymen and blast furnace operators are familiar with the term "Scotch" as applied to certain grades of charcoal iron which contain from 2.50 to 3.50 per cent silicon. The origin of this term goes back to 1890 when the practice of purchasing pig iron by analysis was just coming into vogue.

At that time, Scotch pig iron with a white fracture was imported from Canada for use as a softener. Analysis showed that charcoal iron with about 2.50 per cent silicon gave the same results as the genuine Scotch pig. Rogers, Brown & Co., Chicago, conceived the idea, through the suggestion of F. I. Foote, still in the employ of this firm, of applying the term "Scotch" to the charcoal iron. Accordingly "Hinkle's Scotch" was offered, and tried first at St. Paul and Minneapolis. From that time since, various Scotch irons have appeared and gradually, domestic irons of proper silicon content have come into general use as softeners. The real Scotch iron is no longer imported except on the Pacific coast.

The Carnegie Steel Co., Pittsburgh, has published a pamphlet descriptive of its gear blanks and miscellaneous circular sections. The booklet contains complete information on Carnegie Steel Co.'s standard specifications, and data on the determination of gear dimensions. The sizes of standard motor gears are discussed and drawings and half tone illustrations are presented showing the several gears mentioned. Circular sections are carried in stock for gear blanks, mine and industrial locomotives and car wheels.

Foundrymen Propose Safety Code

The Committee on Safety and Sanitation, American Foundrymen's Association, Issued a Report in Which a Code of Rules is Embodied Which is Believed to Excel Any Previously Issued

THE "Safety First" propaganda which was started with such determination only a few years ago has long since ceased to be a propaganda to the modern foundryman. It is now a prosaic, daily affair. No other branch of the metal working trades has given more thought to the subject of safety for its employes than the foundry industry. The value of this concerted effort on the part of foundrymen is best measured by the tremendous decrease in fatilities and accidents in foundries throughout the country.

But the ultimate goal has not been reached. The committee on safety and sanitation, American Foundrymen's Association, has issued a proposed safety code which, when adopted, will stand as a model of excellence. The committee which met in Rochester, N. Y., July 20 and 21, was composed of a particularly representative body of men, among whom were the following: Victor T. Noonan, chairman, Industrial Commission of Ohio, Columbus, O.; F. H. Elam, American Steel Foundries, Chicago; George B. Koch, Pennsylvania railroad, Altoona, Pa.; E. B. Morgan, Norton Co., Worcester, Mass.; Richard Moldenke, Watchung, N. J.; Thomas J. Soults, Sill Stove Works, Rochester, N. Y.; C. E. Pettibone, Pickands, Mather & Co., Cleveland, and Ralph H. West, secretary, West Steel Casting Co., Cleveland.

In presenting the proposed code, the members of the committee urged its unqualified adoption. The provisions are as follows:

Rule A.—Definition

Section 1.—A "foundry" shall mean a place where any metal, alloy or composition is melted and poured into molds for the making of castings.

Rule B.—Entrances

Section 1.—The term "entrances" shall mean passages for common use provided for employes during working hours, between the foundry and open air.

Section 2.—Entrances to foundries shall be protected by a covered vestibule or its equivalent, which shall be so constructed as to eliminate drafts and of such dimensions as to answer ordinary purposes, such as the passage of wheelbarrows, trucks, and small industrial cars. This rule shall not apply to entrances used for railroad or industrial cars handled by locomotives or motors, or for traveling cranes, horse-drawn vehicles or automobiles; these entrances may remain open for such time as is necessary for the ingress and egress of such cars, trucks and cranes, horse-drawn vehicles or automobiles. No locomotive shall be permitted to remain inside the foundry during the loading or unloading of the cars.

Presented at the September meeting of the American Foundrymen's Association, Cleveland.

Rule C—Gangways

Section 1.—The term "gangways" shall mean well defined passageways dividing the working floors of foundries, but not the spaces between molds.

Section 2.—Gangways other than those for carrying molten metal shall be of sufficient width and properly illuminated to safely allow the passage of men and materials. They shall be kept free from obstruction at all times.

Section 3.—Main gangways where metal is carried by hand or buggy shall be of sufficient width to allow the passage of two ladles going in opposite directions, with an additional side clearance of six (6) inches.

Section 4.—Main gangways for crane ladles shall be wide enough to allow a clearance of eighteen (18) inches on each side of the largest ladle used, except in such cases where ladles are carried with a clearance of at least 6 feet above the floor.

Rule D—Aisles

Section 1.—Spaces between molds shall be divided into three classes, which shall be known as "hand-ladle" aisles, "buggy-ladle" aisles and "crane-ladle" aisles.

Section 2.—Hand-ladle aisles—when a ladle is carried by one (1) man—shall be of sufficient width to allow two (2) men to pass.

Section 3.—Hand-ladle aisles—when ladles are carried by more than two (2) men—shall be wide enough to allow two (2) men to walk abreast, with an additional total clearance of six (6) inches.

Section 4.—Buggy-ladle aisles shall be of sufficient width to accommodate the ladle with a clearance of six (6) inches on each side.

Section 5.—Crane-ladle aisles—leading from the molds to gangways—shall be of sufficient width to permit the safe ingress and egress of employes and safe use of ladles.

Section 6.—During the progress of casting, every gangway or aisle shall be kept entirely free from pools of water or obstruction of any nature. Every gangway where industrial tracks are used shall be constructed of a hard material of substantial character, and the top of the rails shall be flush with the floor.

Rule E—Ventilation

Removal of Smoke, Steam, Gases and Dust

Section 1.—Every foundry shall be so ventilated during working hours that smoke, gases, fumes, or dust injurious to the health of employes shall, as far as practicable, be rendered harmless by means of natural circulation of air, or by ventilating hoods, fans or other effective devices.

Section 2.—Where the operation of drying ladles causes fumes or gases within the foundry, ventilating hoods shall be provided to remove such fumes or gases.

Section 3.—All ovens, from which fumes or gases escape shall be provided with hoods of sufficient capacity to remove such fumes and gases.

Section 4.—Foundries in which alloys containing zinc or aluminum are melted or poured shall have a minimum ceiling height of at least fourteen (14) feet. Every furnace shall be provided with ventilating apparatus to effectively remove all noxious fumes and gases. The ceilings of such foundries shall be at least six (6) feet above curb lines.

Rule F—Lighting

Section 1.—The light in every foundry shall be sufficient to provide safe entrance and exit of employes, and to carry on work safely during working hours.

Section 2.—When natural light is insufficient to properly light the foundry, artificial light of sufficient power shall be provided.

Section 3.—The continuous use of hand torches or other lamps that emit injurious smoke or gases is prohibited.

Rule G—Heating

Section 1.—The temperature in every foundry shall be maintained at not less than fifty (50) degrees Fahrenheit during working hours in all sections where employes are regularly working.

Section 2.—The use of open salamander stoves shall be prohibited.

Rule H—Sanitation

Water Closets

Section 1.—Water closets shall be

provided in every foundry for each sex, according to the following table:

Number of Persons.	Number of Closets.	Ratio.
1 to 10	1	1 for 10
11 to 25	2	1 for 12½
26 to 60	3	1 for 16⅔
61 to 80	4	1 for 20
81 to 125	5	1 for 25

For every unit of 45 or fractional part thereof in excess of 125 employes; an additional water closet shall be provided. Where water and sewage facilities are not available, sanitary chemical closets may be used.

Rule I—Urinals

Section 1.—Urinals shall be provided in accordance with the following table:

Number of Persons.	Number of Urinals.	Ratio.
1 to 30	1	1 to 30
31 to 80	2	1 to 40
81 to 160	3	1 to 53⅓

And thereafter an additional urinal to every eighty (80) employed. One individual urinal shall be considered equivalent to two (2) lineal feet of trough or slab urinals.

Rule J—Washrooms

Section 1.—Wash basins with faucets for hot and cold water shall be supplied according to the following table:

Number of Persons.	Number of Wash Basins.	Ratio.
1 to 8	1	1 for 8
9 to 16	2	1 for 8
17 to 30	3	1 for 10
31 to 45	4	1 for 11½
46 to 65	5	1 for 13

For each additional twenty-five (25) employes at least one additional wash basin shall be supplied. Twenty inches of enameled sink, or its equivalent in sanitary properties, shall be considered the equal of one wash basin.

Rule K—Shower Baths

Section 1. — Shower baths shall be provided according to the following table:

Number of Persons.	Number of Showers.	Ratio.
1 to 50	1	1 for 50
51 to 100	2	1 for 50
100 to 200	3	1 for 66⅔
200 to 400	4	1 for 100

For each additional two hundred (200) employes, one additional shower shall be supplied.

Rule L—Lockers

Section 1. — Individual metal lockers arranged for locking shall be provided for employes, and shall be placed in a space used exclusively for such purposes. This space may be located in the washroom, the drying room, or at convenient places in the molding room.

Rule M—Drying Room

Section 1. — Facilities shall be provided, either in connection with locker room, wash or toilet rooms, for the sanitary drying of workmen's clothes.

Rule N—General

Section 1. — All the above sanitary provisions shall be conveniently located in a place accessible to and connected with the foundry so that entrance thereto can be had without exposure to the open air. General recommendations to be approved at end of Code.

Rule O—Drinking Fountains

Section 1.—Drinking fountains shall be installed at convenient places, and the use of a common drinking cup prohibited.

Rule P—Core Rooms

Section 1.—All regulations pertaining to the foundry such as heating, lighting, ventilating and sanitation shall apply equally to the core room.

Section 2.—When core ovens are located in the same room in which the cores are made, the temperature of that part of the room devoted to core making shall not exceed one hundred (100) degrees Fahrenheit.

Section 3. — Separate working space shall be provided where females are engaged in the making of cores.

Section 4. — No female employed in any core making room shall be permitted to handle cores having a temperature in excess of one hundred ten (110) degrees Fahrenheit.

Rule Q—Cleaning and Finishing Operations

Section 1.—All castings shall, where practicable, be cleaned or chipped in rooms separated from those used for other purposes; but where castings are cleaned or chipped in molding or casting rooms, there shall be provided suitable screens, partitions, or other effective means to protect employes against flying chips or excessive dust.

Section 2. — Where finishing rails or benches are used, these must be sufficiently far apart to allow the operatives to pass between them without being endangered by falling castings.

Section 3.—All cleaning and finishing floors shall be cleaned and leveled at sufficient intervals to insure safe working conditions.

Section 4. — When dry tumbling mills are used exhaust apparatus shall be installed and operated that will effectively draw off the dust created by the operation of such mills, or the mills shall be enclosed in reasonably dust-tight compartments while in operation.

Section 5. — When dry grinding, buffing, or polishing floor stand machines are used, exhaust apparatus or its equivalent shall be installed and operated that will effectively remove the dust created by the operation of such machines. This rule shall not apapply to floor or bench stands used specially for tool grinding.

Section 6. — Where swing frame or portable buffing, grinding or polishing machines are used, screens shall be provided to protect adjacent workmen.

Section 7. — All abrasive wheels shall be provided with protection hoods adapted to a proper presentation of the work and be mounted with compression blotters, relieved flanges, at least half the diameter of the wheel.

Section 8. — Sand-blasting by hand-operating apparatus shall be carried on in suitable sand-blast rooms. Sand or shot blast operatives shall be provided with suitable helmets or masks, respirators, approved safety goggles, gloves and leggings.

Section 9. — All men engaged in the cleaning and finishing departments shall be provided with approved safety goggles.

Section 10. — All tools shall be kept free from mushroomed heads and kept properly dressed.

Section 11. — All chisel and hammer handles shall be properly fitted and provided with safety wedges.

Section 12.—All electric arc welding shall be properly enclosed to prevent the egress of light rays. Such enclosures shall be properly ventilated.

Section 13. — The operatives shall be provided with improved masks, gloves, and slow combustion aprons.

Section 14.—The use of high explosives is absolutely prohibited on the foundry premises.

Section 15.—The breaking of castings by the use of a drop inside the foundry during the general working hours is prohibited. When a drop is used for the breaking of castings or scrap outside of the foundry, a permanent shield of heavy planking or other protection shall be provided.

Section 16.—Every employe in every foundry shall use the devices furnished for his protection by his employer where there is a hazard connected with his employment.

Rule R—Equipment

Section 1. — The floor beneath and immediately surrounding a cupola shall be kept free from collection of water.

Section 2.—All pits or openings located in foundry floors shall be guarded by suitable covers or railings or by watchmen.

Section 3. — All ladles pouring from the lip, of two thousand (2,000) pounds or over capacity, shall be equipped with a worm-gear device for tilting same.

Section 4.—All crane, truck and trolley pouring ladles shall be so constructed that the center of gravity shall be below the trunnion, and shall be equipped with a clip to prevent it from overturning.

Section 5.—All single shank hand ladles shall be provided with sheet metal guards.

Section 6. — Where the crown plate of an upright crucible furnace is elevated above the surrounding floor in

excess of twelve (12) inches, the furnace shall be equipped with a platform having a standard rail; such platform shall be constructed of metal or other fireproof material, and shall extend along the fronts and sides of the furnace, flush with the crown plate, and shall be at least four (4) feet in width, and shall be clear of all obstructions during pouring time. If the platform is elevated above the floor in excess of twelve (12) inches the lowering from same of crucible containing molten metal shall be by mechanical means.

Section 7. — When the combined weight of crucible, tongs and molten metal exceeds one hundred (100) pounds, it shall be removed from furnace by two men, or mechanical means, and deposited on the floor.

Section 8. — Equipment used for the movement of materials by overhead cranes, such as sand buckets, shall be of substantial construction. When buckets have movable bails, safety locks or catches shall be provided, and the use of such locks must be enforced.

Section 9. — Substantial cast steel handles shall be provided on grab buckets to afford safe means of pulling or prying apart the jaws in case the cylinders stick.

Section 10.—All equipment such as sand mills, tumblers, etc., shall have gears, belts and all movable parts safely guarded.

Section 11.—All gears, including trolley gears, couplings, keys, set screws and other movable parts shall be completely enclosed by guards, so constructed as to afford easy access for inspection and repairs. Guards shall be strong enough and properly attached to cranes to catch and prevent the falling of the parts which are guarded.

Section 12.—Foot-walks extending the entire length of the crane bridge girders on the line shaft side shall be of substantial construction, rigidly braced to eliminate vibration, having standard railing and toe boards to prevent the falling of workmen and tools, and provide a safe and adequate means of travel about cranes.

Section 13.—Crane cages shall be enclosed to a height of 3 feet 6 inches above the floor with non-combustible material, where molten metal is carried by the crane, otherwise a standard railing and toe board is sufficient.

Section 14.—Fenders shall be provided on all crane end carriage and trolley wheels. These fenders shall be of such shape that they will tend to push a man's hand, arm, or leg away from the wheel.

Section 15. — In all new construction clearances between crane-walks, cages, etc.; and the building walls and roof-trusses shall be ample to insure the safety of crane-men and repairmen.

Section 16.—Suitable electric or mechanical brakes shall be provided to insure the safe movement of cranes and loads.

Section 17.—All cranes shall be provided with a safety lock switch box so that the electric control of the crane can be locked in the off position during inspection and repairs.

Section 18.—All overhead cranes shall be provided with good strong foot gongs to warn workmen of the passage of overhead loads.

Section 19.—The practice of riding chain and crane loads shall be prohibited.

Section 20.—The swinging or dangling of loose crane chains as the crane moves down the floor shall be prohibited. In case it is necessary to move the crane along the floor with the chains dangling, the ends must be guided by chainmen walking beneath.

Section 21.—All jib cranes shall be mounted on substantial foundations, and securely anchored to the building. All gears and moving parts shall be guarded.

Section 22.—All sling beams shall be securely suspended from jib crane hooks, and guards shall be installed on the hook to prevent the beams from jumping out of the hooks. Sling beams shall be so constructed that the slings cannot jump off the beam, and can be readily moved to accommodate different size flasks.

Section 23.—Slings of all kinds shall be constructed of material of proper quality and sizes to insure at all times a safety factor of 10.

Rule S—Inspection

Section 1. — All ladles, ladle shanks, crucibles, crucible shanks, crucible tongs, yokes, skimmers, slag hoes, crane chains, cables, ropes and slings shall, prior to their use, be inspected in regard to their safe condition by the men preparing and using such appliances.

Section 2. — An inspection in regard to the safe condition of all hoisting apparatus and accessories shall be made at least once a month by a man designated by the employers for the purpose, and a record shall be kept of such inspection.

Rule T—Employment of Females

Section 1.—No female shall be employed in a foundry unless upon examination by a physician, it has been determined she is of normal health.

Section 2.—No female employed in any foundry shall lift any object exceeding twenty-five (25) pounds in weight, unless she uses mechanical means by which her physical effort is limited to exertion equivalent to that number of pounds.

Rule U—General Regulations

Section 1. — Regulations affecting industrial establishments generally in respect to the safeguarding of transmission machinery, miscellaneous machinery, elevators, stairways, platforms, chains and cranes, or relating to sanitary conveniences and first aid equipment, not included in this Safety Code, shall apply with equal force to foundries.

Section 2. — When handling molten metal, employes shall wear leggings, when possible goggles, and Congress type shoes.

Recommendations

The Committee makes the following recommendations which it deems most essential in successful accident-prevention work.

Section 1. — All injuries must be promptly reported, no matter how trivial, to proper authorities.

Section 2.—Special efforts shall be made to impress upon all men the necessity of immediately taking care of all minor injuries, cuts, scratches and burns.

Section 3. — It is recommended that tincture of iodine, and not peroxide shall be used for first aid purposes.

Section 4.—Employes must not, under any circumstances, attempt to remove foreign particles from the eyes of a fellow workman; as infection is almost certain to follow the use of toothpicks, matches, fingers or handkerchiefs for this purpose.

Section 5.—All eye injuries shall be attended to by a regular physician.

Section 6.—The use of liquor shall be absolutely prohibited during working hours.

Section 7. — Accident prevention will be encouraged by the formation of safety committees among the men. All foremen must take a personal interest in accident prevention and are expected to set an example of carefulness.

Section 8. — Strict enforcement of workshop regulations is one of the best methods of accident prevention.

Section 9.—First aid kits should contain:

A.—Packages done up in waxed paper containing aseptic dressing and bandages and some safe and effective antiseptic, such for example, as a small vial (1 dram) of 3 per cent solution of tincture of iodine, together with a small camel hair brush.

B.—Splints and a roll of large bandages.

C.—Tourniquet.

It has been proved that 75 per cent of all accidents can be eliminated by educational methods, therefore, the use of bulletin boards, motion pictures, safety meetings and suggestion boxes are to be encouraged.

Section 10.—A room shall be provided and kept in a sanitary condition for the employes' use to eat their meals.

WHAT'S WHAT and WHY

Don't Ask Yourself - Ask Us!

Questions from our Readers answered by Experts

Cast Iron in Tunnel Construction

In view of the extensive use American engineers make of cast iron segments for tunnel construction, what are the technical, economical, or other reasons that might explain the current American practice?

Subaqueous tunnels are constructed in this country by two general methods. That customarily employed involves the use of a shield or some other form of heading. The other is the surface method, which involves the use of caissons. The selection of the method to be used depends upon the depth of the water, the character of the material through which the tunnel is to be built, the tidal conditions, the water traffic conditions and other factors.

The shield method, due to the natural conditions which are encountered, has been found most advantageous in constructing the tunnels of New York harbor. The only exception has been in the case of the Harlem river tunnels. These tunnels, due to the shallowness of the water, and the comparative absence of tidal currents, were constructed by the caisson method under conditions which were found not to be particularly burdensome.

The shield method greatly facilitates the work of construction under air pressure, and, where soft ground is encountered, the employment of air pressure is imperative. Inasmuch as no timbering is needed behind the shield, an unobstructed working space is afforded by this method; in addition, the risk of fire, which is particularly great where a combination of compressed air and such an inflammable material as wood is present, is elminated. In view of the unserviceability of wood, the choice of materials of construction therefore narrows itself to metal and concrete. The expense of the latter is prohibitive, since, due to the difficulty of concreting under air pressure, it would be necessary to place the concrete in very short stretches. Therefore, metal linings customarily are used, and the form which proves most practicable where the shield method is used is a lining composed of cast iron segments. The use of a cast iron lining renders safe what otherwise would be a hazardous undertaking, due not only to the considerations mentioned above but to the fact that cast iron linings, when properly caulked, in addition to being absolutely watertight afford during the period of construction, an air tight structure from within. The latter would be exceedingly difficult to secure by any other means.

With one exception, there are at the present time no subaqueous tunnels in New York harbor where a metal lining has not been used or has not been specified. The exceptional case alluded to occurs in connection with a portion of the proposed Sixtieth street, East river tunnels, which is to be built through rock. Due to the great depth of rock cover, and the formation of the rock itself, it is expected that the metal lining will be dispensed with.

Where the tunnel is constructed from the surface in open or closed caissons, the use of steel proves more economical than cast iron as a material of construction, since it can be used in larger and thinner units than cast iron. The earlier Harlem river tunnels were built both of cast iron segments and steel, while the last to be constructed were of steel only.

In case the metal lining does not afford a sufficiently rigid structure, concrete linings, reinforced or unreinforced, may be employed. In fact, most of the subaqueous tunnels of New York harbor are concreted both within and without the metal lining. The exterior concreting is provided to fill the space between the tunnel and the earth or rock, thus protecting the tunnel structure from deformation due to lack of adequate external support.

An interesting tunnel now under construction at Boston, is being built of timber, lined with a waterproof fabric, which in turn encloses a concrete lining. This tunnel is being constructed by heading methods in clay which does not permit the free passage of water, therefore rendering it unnecessary to use much air pressure. Thus the necessity for having an air-tight and water-tight structure during the period of construction is, due to the occurrence of the clay, not as urgent as in New York harbor where less favorable geological conditions are encountered.

(Prepared with the assistance of Charles E. Conover, designing engineer, public service commission, first district, state of New York.)

New Type of River Craft

I notice that in the present controversy between the United States engineers and the city of Pittsburgh over the question of raising the height of the bridges over the Allegheny river, the design of river boats is frequently mentioned. Can you tell me in what way the design of these boats is connected with the problem of bridge-raising?

The United States engineers recommended the changing of the bridges over the Allegheny to accommodate the present type of stern-wheel vessels. The federal engineers seem to be convinced that this type of river craft is peculiarly adapted to the swift currents of the Allegheny and Monongahela rivers, and evidently have not considered any other type of boat as being satisfactory in these waters.

The city of Pittsburgh is basing its protest against changing the bridges upon the belief that the two screw-propelled steel barges now being constructed will revolutionize river traffic. If the new type of craft proves satisfactory, there will be no necessity for raising the bridges as the motor barges will easily clear the present spans.

Making Electrical Pyrometers at the Brown Instrument Co., Philadelphia

View of the Instrument Shop Where Thermo-Couples and Mechanical Parts Are Made

Section of the Laboratory Where the Electrical Systems Are Fitted to the Instruments

How Electrical Pyrometers Are Made

BY R. P. BROWN

THE science of pyrometry, which has to do with the measurement of temperatures beyond the range of the ordinary thermometer, is of comparatively recent origin. It was not applied extensively until in late years, when the growing exactions of manufacturing processes generally, as well as the development of handy and highly accurate pyrometers, led to the use of the latter on a constantly increasing scale. At the present time these instruments are employed in practically all industries where high temperatures are encountered.

The first pyrometers made in this country were produced in 1860 by the late Edward Brown, founder of the Brown Instrument Co., Philadelphia. These pyrometers were based on the principle of the difference in expansion of dissimilar elements when subjected to a change of temperature. They consisted of a graphite rod encased in a steel tube, and a dial graduated in degrees of heat. When subjected to high temperatures, the steel tube expanded, while the graphite did not expand. This difference in expansion was indicated by multiplying means in degrees of temperature. Instruments of this type are still used for indicating low temperatures which need not be determined with great accuracy.

Fundamental Principles of Electrical Pyrometer

The electrical pyrometer came later, and it is no exaggeration to state that the progress in the development of this instrument measures to some extent the progress in many manufacturing processes in which the correct determination of temperature is a vital factor. The operation of the electrical pyrometer depends upon two physical phenomena: A current of electricity is generated at the junction of two dissimilar metals when exposed to a high temperature, the strength of the current varying with the intensity of the heat; when this small current is permitted to pass through a coil consisting of a number of turns of insulated wire of small diameter, supported by steel pivots in sapphire jewel bearings, and located in the magnetic field of a permanent magnet, the coil will rotate. By means of a pointer at-

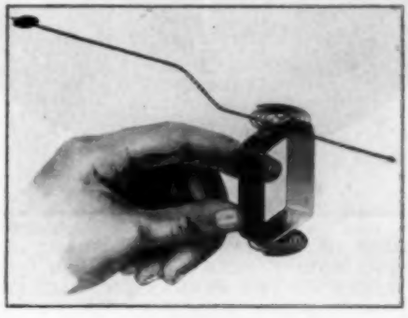


FIG. 1—MOVING ELEMENT OF THE INSTRUMENT, SHOWING COIL USED IN LOW RESISTANCE TYPE

tached to the coil the amount of rotation or deflection can be easily read upon a scale. Such an instrument is commonly known as a galvanometer. In pyrometer construction, however, the combination of two dissimilar metals exposed to the heat is referred to as a thermo-couple, and the measuring instrument as a millivoltmeter.

The thermo-couple is constructed by welding two wires, of the same diameter and composed of dissimilar metals, into the form of the letter U. The two legs of this unit are provided with wiring posts to which leads to the millivoltmeter are connected. So-called base metal thermo-couples are employed in measuring temperatures lower than 1800 degrees Fahr., while for temperatures between this limt and 2950 degrees Fahr., rare metal couples are used. In choosing the metals for the wires, it is of course, necessary that the combinations for each type of couple not only will generate sufficient thermo-electric current, but that they will withstand the high temperatures to which they are exposed in service. A desirable base metal thermo-couple consists of a wire of nickel-chromium and another of nickel-manganese or nickel-aluminum. The wires are usually ⅛ or ¼ inch in diameter. They are insulated to prevent short circuits, and are encased in closed tubes made of metal designed to resist high temperatures.

The rare metal thermo-couple is usually formed of one wire of chemically pure platinum and the other platinum and 10 per cent rhodium, the wires having a diameter of about 0.02 inch. These wires are insulated in small porcelain two-hole insulators and protected by tubes of porcelain, silica, or other materials which are impervious to gases.

The Indicating Instrument

The millivoltmeter, or that portion of the pyrometer which gives the temperature reading, consists of a permanent, U-shaped magnet whose positive and negative poles are separated by a cylindrical opening in which is inserted a soft iron core around which swings the moving element shown in Fig. 1. The latter is a fine wire coil, wound on an aluminum form in the shape of a rectangle so that it may rotate in the gap between

the pole pieces of the magnet and the soft iron core. Originally, the coil was held in suspension by fine wires but this construction proved too frail for practical use. The coil is now carried by means of sapphire jewel bearings which withstand the roughest usage to which the instrument ordinarily is subjected. To one end of the coil frame is attached a pointer which moves across a dial calibrated in degrees of heat, either Fahrenheit or Centigrade, as desired instead of being calibrated in electrical units. The millivoltmeter operates as follows: When a change in temperature of the thermo-couple generates an electric current; this current sets up in the moving element a magnetic field, which combined with the field of the permanent, U-shaped magnet causes the coil to rotate in proportion to the strength of the current generated by the thermo-couple. Thus the pointer is deflected from the zero mark to a figure calibrated to correctly indicate the temperature. The coil is provided with exceedingly sensitive springs which return the pointer to the zero mark as soon as the magnetic disturbance in the coil has ceased. The assembled instrument with cover removed is shown in Fig. 2. Where accurate temperature readings are required, and particularly where small diameter platinum-rhodium thermo-couples are employed, the use of high resistance instruments is essential. Such instruments have a resistance of 200 ohms or more, compared with about five ohms for the low resistance instrument. As a result, the high resistance instrument gives practically errorless temperature readings irrespective of changes in the length of the leads from the thermo-couple to the instrument, of changes in temperature along the leads, and of the distance the thermo-couple is inserted in the heat to be measured. All these factors result in incorrect readings with low resistance instruments, unless steps are taken to eliminate or counterbalance their affects. Unlike the low resistance instrument, the high resistance instrument may be connected to one or more thermo-couples, or two high resistance instruments, one for indicating and the other for recording, may be connected to the same thermo-couple without special calibration in any case. The distinctive features of the high resistance instrument are, that the moving element, by the use of finer gage wire, has many more turns in the coil, and the coil form is much narrower and has less inertia than the coil in the low resistance instrument.

Various devices have been perfected at different times for eliminating errors which commonly arise in taking readings with thermo-electric pyrometers. To do away with inaccuracies resulting from the effect of the room temperature on the cold ends of the thermo-couple, it has been customary, and still is customary in some steel plants, to provide the cold ends with a water jacket and keep a stream of cold water constantly flowing over them, thus maintaining a uniform temperature. One improved method which accomplishes this purpose with much less trouble consists of sinking compensating leads from the cold ends to a point 10 or 20 feet below the surface of the ground, at which depth the temperature is practically constant at all seasons of the year. For absolutely maintaing the cold junction at a given temperature, by another method, a so-called "compensating box" has been devised. This box is heated by an ordinary electric lighting system, and is provided with a contact of the make-and-break type which maintains a fixed temperature; its operation is similar to that of an ordinary thermostat. The cold ends of 20 to 30 thermo-couples may be extended to this box by means of compensating leads, and thus all may be kept exactly at the same cold junction temperature.

Pyrometers are made in a large variety of designs to meet all possible requirements; each design is furnished in portable or stationary form, and may be of the high or low resistance type, as desired. The simplest type of instrument is the indicating pyrometer which is limited to indicating the temperature to which the thermo-couple is exposed at the moment of reading. Where a record of the variations in temperature at a particular point is desired, a recording pyrometer is employed. A simple recording pyrometer is of the same construction as the indicating pyrometer, except that it is provided with a clock mechanism on which is mounted a circular chart. On this chart, as it revolves, the pointer inscribes a curve representing the temperature performance at a given point during a given period, usually 24 hours. Another recording instrument widely used is the continuous chart recorder, which records heat performances over a period of 60 days. Numerous variations of these instruments have been developed to suit special purposes. For instance, a 60-day recorder recently was put on the market which maintains a continuous record of the simultaneous readings of eight separate thermo-couples. The records are made by the same pointer by means of a revolving contact switch. A multi-colored carbon ribbon is used in order that each record may be inscribed in a distinctive color.

Pyrometers may be provided with a bell which will ring when a certain temperature has been reached. This feature is especially useful in connection with annealing and drying ovens and other installations where definite temperatures may not be exceeded. Pyrometers may be furnished with electric lighting attachments in order that readings may be taken with ease in dark places. For measuring exceedingly high tempera-

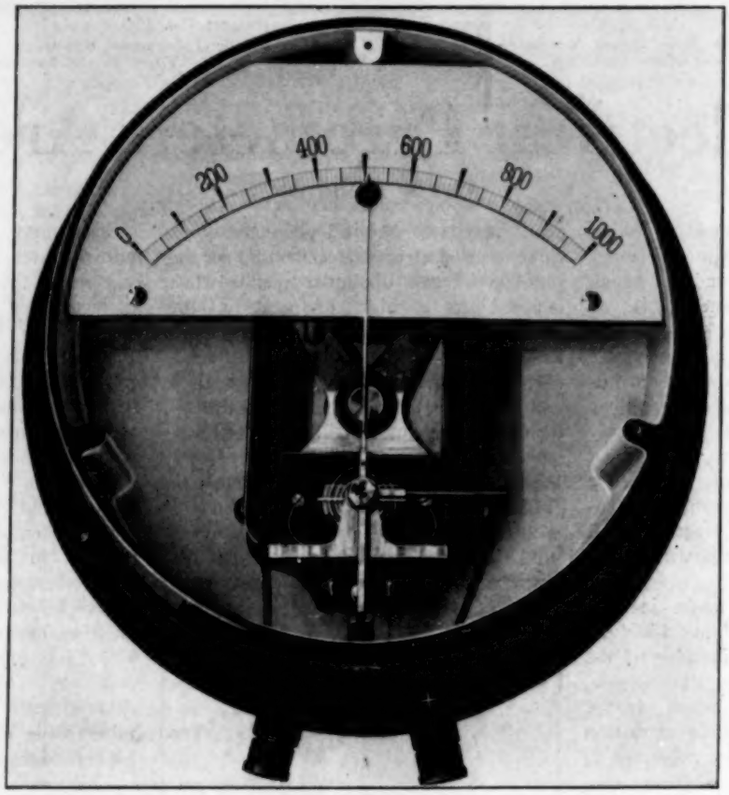


FIG. 2—INTERIOR OF THE INSTRUMENT, SHOWING METHOD OF MOUNTING MOVING ELEMENT BETWEEN OPPOSITE POLES OF THE PERMANENT MAGNET

tures, so-called radiation pyrometers are used. The heat is permitted to radiate from the opening of the furnace into a tube which contains a concave, silvered mirror. The latter deflects the heat upon a sensative thermo-couple, and the current thus generated is read in the customary way.

Accuracy is Essential

The manufacture of pyrometers is an involved and complicated process which calls not only for extreme accuracy in making and assembling of the necessary parts, but also for a high degree of scientific knowledge. The industry, as it is conducted at the plant of the Brown Instrument Co., Philadelphia, includes in its scope another industry—the manufacture of clocks—since each recording instrument must be fitted with a clock mechanism. In making a simple, 24-hour recorder 194 parts are required. For making the latest improved type of continuous recorder, 385 parts are needed. These instruments are put through the manufacturing process in groups; the continuous recorders above mentioned, for instance, are made in groups of 30. The different stages of manufacture are classified, and each classification assigned to a man or group of men. The clock movement is built up in the instrument shop and subjected to rigid inspection and test. The instrument is then taken to the laboratory and fitted with the electrical system, after which it is calibrated to the desired temperature ranges. In calibrating, each instrument is compared with a standard checked by the bureau of standards, Washington. The completed instrument is transferred to the inspection department, and passed upon for accuracy of performance and quality of workmanship.

Owing to the large number and large variety of parts which are necessary, the Brown Instrument Co. has found it necessary to devise an unusually elaborate system for keeping track of them. Approximately 30,000 different parts and raw materials are maintained in the store room. These include iron and brass castings, sheet brass and steel, steel, copper and aluminum tubing, wire of many gages and compositions, jewel bearings, countless sprockets and gear wheels, and a vast variety of other materials. Some of them are manufactured in the shop but most of them from their nature, have to be purchased. The storekeeper is responsible for all of them and he delivers them only on requisitions signed by properly authorized individuals. He has stock cards for each kind of material, and these always show the supply on hand; in addition, each card shows the figure below which the stock may not be permitted to drop. The cards thus afford automatic notification when the stock needs replenishing.

The Brown Instrument Co. maintains a development department, with men whose time is not occupied at all with general manufacture, but who devote all their time and energy to development work. Experimental work is constantly carried on to improve the electrical systems in the instruments, to improve the construction of the thermo-couples or alloys used in their manufacture, and to produce new forms of temperature measuring devices. Probably no part of the work of producing pyrometers is more interesting than this development work which is carried on constantly.

Busy Canadian Company

Toronto, Sept. 25.—At a recent meeting of the directors of the Nova Scotia Steel & Coal Co., held at New Glasgow, N. S., on Sept. 14, it was stated that a large amount of additional business had been secured during the past month so that there are now sufficient orders on the books to keep every furnace and mill fully employed for 12 months.

The Eastern Car Co., a subsidiary concern, has completed the first contract for 1,000 cars for the French government, which have been delivered, and expect to begin delivery on the second order for 3,000 cars next month. Work has also been started on 500 freight cars for Canadian government railways, and negotiations are being carried on with another foreign government for the building of 4,000 cars.

Ordered to Refund

The interstate commerce commission has ordered the Pittsburgh & Lake Erie railroad to pay the Pittsburgh Steel Co., Pittsburgh, $14,186, with 6 per cent interest from Nov. 1, 1913, for excess freight charges. Certain allowances are made to steel companies having their own locomotives for transferring cars from the main lines of the railroads to mill sidings. The Pittsburgh company had not been given any allowance.

Getting More Serious

Toronto, Sept. 25.—The shortage of labor for munition factories, which is daily becoming a more serious problem, is engaging the attention of the Canadian government. An investigation has been made by Hon. Robert Rogers and Hon. T. W. Crothers as a sub-committee of the cabinet, and their report is now under consideration. The principal suggestions for relieving the situation are the temporary suspension of the Alien Labor act so as to permit manufacturers to engage laborers in the United States, the closing down of public works under construction so as to free the labor employed for enlistment or work on munitions, and the more general employment of women in the lighter classes of work in the munition plants as well as in other important industries.

Will Make Cold Drawn Steel

Chicago, Sept. 25.—The Union Drawn Steel Co., Beaver Falls, Pa., manufacturer of cold drawn steel, in shafting and other forms, is building a plant at Gary, Ind., which is expected to be in operation about Jan. 1. The plant will be of steel and concrete, two stories, 150 x 456 feet and will be equipped to turn out a full line of this class of goods to supply the western trade. Its location is close to the plant of the Illinois Steel Co. at Gary and railroad service is excellent.

Special machinery for producing cold drawn steel is being built at Beaver Falls for installation at Gary, as this form of equipment is not available in the market.

The company now operates two plants at Beaver Falls and one in Canada, the Gary plant being the fourth in its chain.

Large Gravity Carrier Installation

The American Locomotive Co. has placed an order with the Mathews Gravity Carrier Co., Ellwood City, Pa., for 15,000 feet of 8-inch heavy-duty roller conveyor. This conveyor will be utilized for handling shell forgings throughout the entire plant of the American Locomotive Co., at Richmond, Va. During the process of manufacture, the forgings will be handled exclusively by gravity conveyor lines. The system will include several automatic, inclined elevators located at various points.

The Mathews Gravity Carrier Co. has also received an order for 9,000 feet of an 8-inch heavy-duty roller carrier from the E. W. Bliss Co., Brooklyn, N. Y. This conveyor will be used for the same purpose as that in the plant of the American Locomotive Co. The total amount involved in these two contracts is over $100,000.

The Davies & Thomas Co., Catasauqua, Pa., has taken the contract for furnishing a large tonnage of cast iron segments for use in the construction of the new Sixtieth street tunnel under the East river.

Co-operation Keynote of Convention

Chicago Convention of the Association of Iron and Steel Electrical Engineers was a Great Success—Many Valuable Papers Presented—Program Included Banquet, Ball and Inspection Trips

AN EARNEST effort on the part of the engineers in steel mills to co-operate with the designing engineers characterized the tenth annual convention of the Association of Iron and Steel Electrical Engineers at the La Salle hotel, Chicago, Sept. 18 to 22. This tendency was also manifested among the different builders of electrical machinery and indicated a sincere desire on the part of all manufacturers to meet the rigid requirements of the iron and steel industry with the most substantial and reliable equipment that the electrical engineers can devise. The program of papers read during the convention was especially commendable because of its variety.

A desire which was current in a number of discussions was for a simplification of the present mill motors and the supplementary control equipment. Many participants in the discussions emphasized the contention that the present refinements or complications, as the case may be, of modern electrical equipment has resulted from the exacting demands for unusual performance made by steel manufacturers. As an illustration, it was pointed out that the commutation considered excellent 10 years ago would be rejected today. It is believed that the extreme peak loads and the unfavorable ventilating conditions imposed upon mill motors certainly necessitate different design and construction than the ordinary industrial motor.

Business Session

Monday morning was devoted to registration, and the total attendance was the largest in the history of the association, 250 members being present. At the business session, the following officers were elected for the coming year: President, F. D. Egan, steam, hydraulic and electrical engineer, Pittsburgh Crucible Steel Co., Midland, Pa.; first vice president, C. A. Menk, electrical superintendent, Homestead Works, Carnegie Steel Co., Munhall, Pa.; second vice president, Stewart C. Coey, assistant superintendent, electrical and mechanical departments, Youngstown Sheet & Tube Co., Youngstown, O.; secretary, John F. Kelly, assistant electrical superintendent, National Tube Co., McKeesport, Pa.; treasurer, James Farrington, electrical superintendent, La Belle Iron Works, Steubenville, O. Following the election of officers, the association voted to amend the constitution to provide for an increase in the dues of associate members from $5 to $7 a year. Provisions were also made to admit firms in the iron and steel industry to membership in the association as "firm members". The dues for such membership will vary from $25 to $100 a year, based on the payroll of the firm. Industrial lighting fixtures, wire and cables, electric shop signals and similar equipment were exhibited by the Central Electric Co., Crouse-Hinds Co., the Benjamin Co. and the Western Electric Co.

The ladies who were so fortunate as to be present during the convention were entertained Monday afternoon at cards and in the evening at an informal reception and dance. A 50-mile drive through Chicago's parks and boulevards with a luncheon at the South Shore Country Club occupied their time Tuesday. W. L. De Coursey, sales manager, Economy Fuse Co., Pittsburgh, Pa., directed a vaudeville production in the hotel banquet hall Tuesday night.

Favorable Criticism Evoked

The first technical paper to be read, "The Value of Records to an Operating Engineer", by R. S. Huey, superintendent, Duluth plant, Universal Portland Cement Co., received favorable criticism and evoked some interesting opinions in regard to the practical value of various records. A. M. MacCutcheon's paper on "The Cost Versus Upkeep of Direct-Current Motors" gave considerable valuable information in regard to the various items of expense in the maintenance of direct-current motors. The design of these machines plays an important role in the cost of upkeep.

Tuesday morning the central station power committee of the association presented the results of its investigations in the form of a paper called "Central Station Power for Steel Mills". Central station power has become an important factor in the consideration of the power problems of the steel plant. The problem, primarily, is an economic one and involves an analysis of the power costs at private plants and of the rate schedules offered by the central stations. Such analyses were made in detail by the committee and were presented with the paper. The committee believed that the electric furnace, in particular, offered a very desirable load for central stations and further that the development of these furnaces is dependent upon the future development of the central station.

Some of the fundamental principles to be observed in planning buildings for steel plants were pointed out in a paper by C. A. Randorf on "Design of Structures for Steel Works". New buildings recently erected for the Lackawanna Steel Co., Buffalo, formed the basis of Mr. Randorf's paper, which gave suggestions on methods of ventilation, types of flooring, location of machinery and other essential features. Tuesday afternoon was spent in visiting the power stations of the Commonwealth Edison Co., at Chicago.

Joint Meeting

The Wednesday program was somewhat unique in that it included the first joint session of the American Institute of Electrical Engineers and the Association of Iron and Steel Electrical Engineers. The first institute paper, "Underground Distribution Systems", by George J. Newton, did not specifically concern problems of the iron and steel industry, but advocated such systems as the ultimate solution of the distribution problem that confronts every power company operating in progressive towns and cities. The author stated, however, that the excessive cost of this class of construction as compared with overhead construction, warranted a careful study of the conditions before installations are made. The financial success of an electrical venture depends upon supplying efficient and reliable seryice in an economical manner and to secure this end, the distribution system must be carefully designed and properly installed. At the conclusion of the paper, A. F. Hovey, construction superintendent, Standard Underground Cable Co., Pittsburgh, expressed the opinion that the general specifications for underground installations included in the paper offered an excellent basis for laying out the specifications for any particular installation. Mr. Hovey offered the suggestion that the feeders be placed at the bottom of the duct lines and the secondary distribution lines on

top so as to be more readily accessible for the necessarily frequent tapping. C. A. Menk, after expressing his views on the economic features of such installations, gave a new turn to the discussion by bringing up the question of choice between single and triple conductor cables for use where three-phase power is to be transmitted. The consensus of opinion was that the triple-conductor cable is preferable and that its use is restricted only by mechanical limitations. Transmission in single-conductor cables always involves large inductive losses due to sheath currents. The difficulty in making joints in the triple cables may be overcome by fanning into single conductors in junction manholes. Disadvantages of the underground system as applied to steel mills are excessive temperature where the conduit passes furnaces, liability to short circuit from flooding and inaccessibility in case of actual breakdown. B. G. Beck, electrical engineer, American Sheet & Tin Plate Co., Gary, Ind., and F. H. Woodhull, superintendent, electrical department, Lukens Iron & Steel Co., Coatesville, Pa., also participated in this discussion.

Discussion on Unaflow Engine

The paper presented by W. Trinks, professor of mechanical engineering, Carnegie Institute of Technology, on the "Unaflow "Engine" evoked some very interesting and lively discussions. Professor Trinks prefaced his presentation by stating that he had no ax to grind and that his study of the unaflow engine, both in the United States and in Europe was influenced only by pure science. He remarked further that he did not recommend this type of engine as a panacea, but claimed it to have advantage under variable load conditions and also in cases where steam engines must be replaced and the capital is not available for electrification. S. C. Coey, assistant superintendent, mechanical and electrical departments, Youngstown Sheet & Tube Co., Youngstown, O., told of a 12-inch merchant mill which is being operated satisfactorily by a unaflow engine. In a letter read before the meeting by the secretary, G. E. Emmons, Chicago Pneumatic Tool Co., Chicago, pointed out that the tendency to increase steam engine efficiency by increasing pressure and by superheating also increases the line losses. In defense of the corliss engine, Joseph Breslove, sales engineer, Allis-Chalmers Co., Pittsburgh, remarked that whereas the unaflow engine shows the best efficiency at approximately two-thirds full load, the corliss type operates efficiently at rating and even under overload. Compared with the simple engines, he believed the unaflow to be superior. Representatives of four builders of unaflow engines and two manufacturers of mill motors failed to enter the discussion. J. H. Wilson, superintendent, electrical and mechanical departments, American Rolling Mill Co., Middletown, O., and Professor Trinks debated upon the effect of flywheels as supplied to mill motors upon the steam demand made on the boiler. Professor Trinks concluded the discussion by reiterating some of his previous statements and added that he considered it advisable to use motors on installations requiring less than 900-horsepower.

Steel Wires for Transmission Purposes

The second paper offered by the American Institute of Electrical Engineers, "Steel Conductors for Transmission Lines" was presented at the afternoon session by the author, H. B. Dwight. The context indicated that there is an opening for the profitable use of steel cables for transmission purposes, especially on branch lines. The author believed that steel wire would not be economical on main lines except for long spans and where corona is excessive. Steel cables for alternating current should be finely stranded and the different groups of wires should be spiralled in opposite directions. Considerable data were presented with this paper for illustrative purposes.

Instead of reading his paper, "Advantages of Modern Types of Direct-Current Machines", David Hall, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., discoursed briefly upon pertinent paragraphs. The high peaks and the unusual overloads characteristic of mill practice, led to the adoption of the commutating and compensating coils on direct-current mill motors. Such complications in motor construction, according to W. T. Snyder, retiring president of the association, do not invariably result in satisfactory operation. The most essential factors in modern design, he declared, are to eliminate commutator troubles and to make the control devices more simple. Mr. Snyder looks forward to the time when an armature winding is evolved which will take care of all commutation. Interpoles were said to aggravate conditions unless properly adjusted. James R. Downs, manager, Pittsburgh office, Burke Electric Co., stated that the satisfactory operation of a motor for a given installation depends upon individual design which must be based upon a knowledge of the cycles of operation, the character of the steel to be rolled, type of drive, the position of the motor and the number of bearings. He urged that the operators of mill motors base their judgment on performance rather than on initial cost. An interesting trend was given to the discussion when D. B. Rushmore, chief engineer, power and mining departments, General Electric Co., Schenectady, N. Y., told of the conditions American manufacturers of electrical equipment will have to meet in foreign fields. The ratings of motors must be changed to indicate the maximum capacity instead of making allowances for severe overloads. Sparking on machine-tool motors, according to R. S. Huey, may be reduced considerably by suitable interpoles.

Electric Furnaces

The "Mechanical and Electrical Operation of the Heroult Electric Arc "Furnace" was described by G. W. Richardson, electrical superintendent, American Bridge Co., Pencoyd Iron Works, Pencoyd, Pa. Mr. Richardson, who used lantern slides showing installations and diagrams to illustrate his discussion, declared that electrical energy for furnaces could not compete with coal or gas in the matter of cost. He did believe, however, that the increased quality of steel made in electric furnaces more than compensated for the increased operating expense. Subsequent discussion brought forth the general opinion that the electric furnace is still in the adolescent stage. Difficulty is being experienced by operators of these furnaces in securing a good contact between the electrode and the contact clamp or receiver, so as to prevent heating and reduce the voltage drop. Expansion and contraction of the electrode due to the heat of the furnace causes extensive trouble by increasing the contact resistance and in some cases, causing fracture of the electrodes at the point of fastening. Threading the electrode to screw into the cap is another

Rule for Success

"Live to please others and you are bound to be successful in all your efforts," said A. H. Swartz, traveling salesman, Westinghouse Electric & Mfg. Co., in thanking the members of the association for the handsome gold watch they gave him as an appreciation of his work as chairman of the convention committee. The tenth annual convention holds the record for attendance and for the amount of work achieved during the meetings.

source of trouble, especially on the electrodes for the larger furnaces. One of the methods evolved to reduce contact resistance is to use a paste of graphite with a binder which is spread on the end of the carbon and pressed into the irregularities of the surface as the clamp is tightened. A. T. Hinkley, National Carbon Co., Cleveland, reported that tests made by the Carbon company had shown the contact resistance, expressed in inches of electrode, to be equivalent to 20 to 23 inches on screwed joints, and 12 to 15 inches on joints made with the graphite mixture. The best results obtained were 2 to 6 inches. These results were figured on the basis of a current density of 35 amperes to the square inch.

On large furnaces it has been found necessary to install water jackets around the electrode covering the section passing through the roof of the furnace. Some of the electrodes used in the 15 and 20-ton furnaces are 18 inches in diameter, thus necessitating copper water jackets weighing more than 100 pounds. This weight imposes a severe stress upon the roof of the furnaces. Further difficulties encountered result from removing the carbons from the furnace when tilting. This has been found to be necessary in large furnaces and the cooling effect on the carbon is said to reduce its mechanical strength 15 to 20 per cent. Scaling is another undesirable effect of exposing heated electrodes to the cool exterior atmosphere.

The magnitude of the problem of conducting the current from the transformer to the furnace may be realized from the fact that in some of the larger furnaces as much as 20,000 amperes is supplied to each electrode. Low tension bus bars to carry these high currents are usually made of strips of copper ⅛ x 6 inches, spaced about ⅜-inch apart.

In regard to the quality of steel produced, it was pointed out that the temperature and time elements must be more closely controled if greater uniformity and quality of product is desired. The chemical qualities of the constituents, of course, may be predetermined.

Among those who entered into the discussion were Walter Greenwood, safety engineer, Youngstown district, Carnegie Steel Co.; F. H. Kittredge, chief electrician, Illinois Steel Co., South Chicago, Ill.; C. A. Menk; R. Tschentscher, electrical engineer Illinois Steel Co., South Chicago; C. T. Henderson, engineer Cutler-Hammer Mfg. Co., Milwaukee; D. B. Rushmore and T. E. Tynes, electrical engineers Lackawanna Steel Co., Buffalo, N. Y. At the conclusion of this discussion, retiring President Synder recommended that the association select a committee to report on this question at the next convention.

Electrical Blooming Mills

E. S. Jeffries, electrical engineer Steel Co. of Canada, Hamilton, Ont., received favorable criticism on his paper, "Operating Characteristics of an Electrical Reversing Blooming Mill". K. A. Pauly in the discussion said that the weak feature of present installations is the liability to failure of the mechanical parts. As opposed to the steam engineer builders' point that the electric motor requires more time to reverse than the steam engine, he stated that it was desirable to have the ingot enter the rolls while traveling at low speeds. Acceleration should come after the steel has entered the rolls. These desirable characteristics, Mr. Pauly declared, are possessed by the electric motor. President-elect Egan suggested that an effort be made to standardize tests of mill motors so that all comparisons of steam and electrical drives will have a common basis.

"Control of Direct-Current and Alternating-Current Motors as Applied to Cranes" was the subject of an extensive and excellent paper by Paul Caldwell, sales engineer General Electric Co., Pittsburgh. The paper gave consideration to the desirable characteristics of both alternating and direct current motors. Some little discussion followed in regard to the merits of series and shunt contactors. The last contribution to the technical session was "Portable Electric Tools as Applied to the Iron and Steel Industry", by A. M. Andresen, district sales manager, Van Dorn Electric Tool Co., Pittsburgh. The paper gave a brief history of the development of portable tools and described types of tools applicable to various conditions. The explanation was augmented by views of sections and illustrations of tools under actual working conditions.

Banquet is Entertaining

The tenth anniversary of the association was fittingly commemorated by the most brilliant banquet in the history of the society at the La Salle hotel, Wednesday evening. Music during the evening was furnished by the 80-piece orchestra of the Commonwealth Edison Co. The list of after-dinner speakers included Capt. R. W. Hunt, president, R. W. Hunt Engineering Co., Chicago; W. T. Snyder, retiring president of the association; B. F. Affleck, president, Universal Portland Cement Co., Chicago; P. Junkersfeld, assistant to vice president, Commonwealth Edison Co.; Hon. Harry Olson, chief justice, Chicago municipal court, and Harry A. Wheeler, vice president, Union Trust Co., Chicago. President Snyder opened the remarks of the evening with a short review of the progress of the association during its decade of existence. The association was forced into existence by the demands of the iron and steel industry for improved machinery and of manufacturers who demanded explicit information about the operating conditions to be met by their motors. The co-operation which was effected has served as a wonderful stimulus in electrifying the iron and steel industry. The association has sent representatives before legislatures to promote safety measures and to oppose bills harmful to the development of the industry. The National Safety Council, president Snyder stated, was first initiated by the safety committee of the association. In spite of the hazards inherent to electrical installations, the reports from eight plants employing 20,000 men attribute fewer accidents to electricity than to any other hazard. Upon the conclusion of his remarks, president Snyder, in behalf of the association, presented A. H. Swartz, salesman, Westinghouse Electric & Mfg. Co., with a gold watch as an appreciation of the work he accomplished as chairman of the convention committee. Mr. Snyder then introduced the toastmaster, Capt. Hunt, who is one of the pioneers of the iron and steel industry. After announcing the newly elected officers, Capt. Hunt called upon B. F. Affleck, who advocated association work to broaden a man's viewpoint. The principal address of the evening was made by Hon. Harry Olson. He told of the splendid results accomplished by the application of scientific business methods to the Chicago municipal court. The last speaker on the program, Harry A. Wheeler, typified trained engineers as true constructionists. He urged the profession to avoid too close application to day-by-day problems, stating that the community needed its help in grappling with social and political problems. After the banquet, the members and their guests enjoyed dancing in the hall room of the hotel.

Over one hundred delegates left early Friday morning for Gary, Ind., where they saw the furnaces and mills from a three-car observation train. Returning to Chicago early in the afternoon, the delegates joined the ladies and went to see Chicago's new municipal recreation pier, the final event on the program of a most successful convention.

J. H. Sheadle, Father of the Savings Plan, Friend of the Sailor

JASPER HOLMES SHEADLE, vice president of the Cleveland-Cliffs Iron Co. and of the Lake Carriers' Association, died Friday morning, Sept. 22, at the Women's and Children's hospital, Syracuse, N. Y. Accompanied by Mrs. Sheadle, Mr. Sheadle had started from Cleveland the preceding Thursday on an automobile trip which was to have taken them to the White mountains. A stop was made to visit friends at Skaneateles, N. Y., where he became ill and was taken to Syracuse. At the hospital, it was found that an operation for intestinal trouble was necessary and it was performed Sunday. The patient grew steadily weaker until the end came. With him in his last illness were Mrs. Sheadle, William G. Mather, president of the Cleveland-Cliffs Iron Co. and A. W. Foote, president of the Foote-Burt Co., Cleveland.

Mr. Sheadle came from Pennsylvania Dutch ancestry and was born 57 years ago at New Bedford, Pa. After completing his education in the public schools and at Hiram college, Ohio, he entered the employ of his father in the banking business at Girard, O., where he remained for two years. He then became connected with the Second National bank of Youngstown, and at the age of 24, was made assistant cashier and served in that capacity several years. He then went to New York and after a year in the service of the Standard Gas Light Co., in that city, returned to Youngstown and became intimately associated with the iron and steel industry as secretary and executive officer of the Mahoning Valley Iron Manufacturers' Association.

In 1890, Mr. Sheadle went to Cleveland, to accept the position of secretary of the Cleveland-Cliffs Iron Co., in which capacity he served until Jan. 1, 1914, when he was elected vice president. He was in charge of the iron ore sales department and in recent years had given his attention largely to welfare work. Mr. Sheadle had been vice president of the Lake Carriers' Association since 1903, and since 1909, chairman of the welfare plan committee. His work in this connection is reviewed in an editorial elsewhere in this issue. As a member of the Cleveland chamber of commerce, he rendered important service to his city and he was active as a director in several banks and steamship companies.

Harry Coulby, president of the Pittsburgh Steamship Co., who for many years was intimately associated with Mr. Sheadle, especially in welfare work of the Lake Carriers' Association, says of him:

"In the death of Mr. Sheadle the navigation interests of the Great Lakes have lost one of their ablest men. He had been one of the leaders in the business for nearly 30 years. The work, however, which seemed to particularly appeal to him, and which he loved, was the promotion of the welfare of the sailors. When the welfare committee was appointed a number of years ago, he was selected as its chairman, which position he filled to the day of his death. He was the father of the savings plan and to him alone belongs the credit for originating it and supervising the working out of its details. This plan was eminently successful from the day of its adoption and the sailors of the Great Lakes now have on deposit from their earnings over $400,000. He was also vitally interested in sanitation, proper quarters and clean wholesome living on ship. In his passing the sailors of the Great Lakes

JASPER HOLMES SHEADLE

have lost a friend who gave his time and his energies cheerfully always for their betterment. Mr. Sheadle was a high grade man—clean in words and in thought. I have never known a man of higher character."

Daniel W. Heller, for many years a mill superintendent of the Bethlehem Steel Co., died at South Bethlehem, Pa., aged 70 years.

Harvey N. Loomis, who had been connected with the Gould Coupler Co., Depew, N. Y., and with the General Railroad Signal Co., died at Oneonta, N. Y., Sept. 9, aged 72 years.

William Bunting, president of the Bunting Brass & Bronze Co., Toledo, O., of Spencer street, died last week at Atlantic City, aged 67. He was for 18 years superintendent of the Ohio Brass Co., Mansfield, O.

Simeon Ogden Edison, uncle of Thomas A. Edison, died at East Orange, N. J., Sept. 18, aged 90 years. He was an iron manufacturer in Lorain, O., until his retirement 30 years ago.

John V. Beekman, who had been officially identified with the Lidgerwood Mfg. Co., of Brooklyn and Newark, died at his home at Plainfield, N. J., Sept. 11, aged 74 years. He was a member of the American Society of Mechanical Engineers.

Alexander Watson Black, a director of the Crucible Steel Co. of America, and at one time general manager of the Park Bros. Steel Works, Pittsburgh, died Sept. 17, at his home in Sewickley Heights, near Pittsburgh, aged 69.

Samuel Chapin Pratt, member of the firm of Beals & Co., died at his home in Buffalo, Sept. 15, after an illness of about a month. Mr. Pratt was very well known in Buffalo, having been an active business man in that city for more than 25 years.

John Class, president of the Canton Saw Co., Canton, O., died suddenly at his home in that city Saturday, Sept. 23, from heart disease. Mr. Class has been in the saw business for many years, having taken over the business of the Ballard-Class Co. 45 years ago, which has since been known as the Canton Saw Co.

James M. Denniston, for many years general traveling salesman of the American Steel & Wire Co., died at his place of residence, the Chicago Athletic Association, Aug. 29. Mr. Denniston was born in Pittsburgh in 1866 and the funeral was held in that city. He was well known in wire circles in Pittsburgh and the west.

S. S. Leonard, vice president and manager of the Western Automatic Machine Screw Co., Elyria, O., died in Elyria after a brief illness. Mr. Leonard was a Cleveland manufacturer for sixteen years, going to Elyria in 1906. He was a bank director and ex-president of the chamber of commerce.

Edward Gurney, a prominent figure in the manufacturing industry of Canada, and president of the Gurney Foundry Co., Ltd., Toronto, Ont., died Sept. 18 at his home in Toronto. Coming from a family of foundrymen, his important connection with that trade made him a conspicuous figure, which he further emphasized by his prominence in controversies in favor of high protective tariff for Canada. His interest in public affairs continued until his death.

Beside his presidency of the Gurney Foundry Co., in Toronto, he was president of the Gurney-Massey Co., Montreal, Que., and Gurney Heater Mfg. Co., Boston, Mass. He also was vice president of the Gurney-Northwest Foundry Co., Winnipeg, Man., the North American Life Assurance Co. of Canada, and member of the Toronto, National and Automobile clubs. Mr. Gurney was president of the Canadian Manufacturers' Association in 1879-80, and of the Toronto board of trade in 1897. More recently he was elected to the presidency of the Crown bank. For a time he was a member of the Tamiskaming railroad commission.

Mr. Gurney was born in Hamilton, Ont., in August, 1843, where he received his early education in the public schools. As a young man he began work in the foundry of his father and uncle, E. and C. Gurney in that city. In 1869 he became head of the branch at Toronto, which later became one of the largest foundries in the dominion.

New Tractor Plant

Chicago, Sept. 25.—The new tractor plant of the Moline Plow Co., Moline, Ill., is practically complete and some departments are already in operation. The remainder is expected to begin work about Oct. 10. The output will be tractors designed for all sorts of farm work, from plowing to harvesting and furnishes a power plant for other uses as well. It is planned to turn out about 20,000 machines a year.

The works will cost almost $750,000 and is financed out of surplus, no new capital being involved.

The W. P. Hannon Co., Youngstown, has received a contract for structural steel and fireproofing material for foundations and walls of soaking pit furnaces from the Mark Mfg. Co., Chicago, which is building a steel works at Indiana Harbor, Ind.

Rail Shortage

May Be Relieved by Action of Canadian Government

Toronto, Sept. 25.—It is officially announced by the Canadian government that an arrangement has been made with regard to supplying rails required by the railway companies, which will temporarily satisfy their urgent requirements. Owing to the fact that the steel companies have latterly devoted their principal attention to the making of war munitions, there has arisen a great shortage of rails, the railways being unable to obtain those needed for track maintenance. The exact line of policy to be pursued in order to relieve the situation is not indicated, but in the light of previous semi-official utterances it is understood that the customs duties on rails will be temporarily suspended.

The steel interests of Canada are strongly opposing the new freight rates on iron and steel traffic from interior points to the seaboard and have asked the railway commissioners for a suspension of the tariff which otherwise goes into operation Oct. 1. They claim that the rate is much higher than the rates from American producing points to the United States seaboard, and point out that at present they have to import large quantities of raw material from the United States from which the railways derive a large revenue as the result of increased rates and urge that in shipping to Atlantic ports they should not be placed in a worse position than American manufacturers.

New Steel Castings Foundry

The new plant of the Superior Steel Castings Co., Benton Harbor, Mich., is nearing completion and shortly will be in a position to make shipments of steel castings weighing from a few ounces to 12 tons. The main building, which has a floor area of 30,000 square feet, is served by a 20-ton electric traveling crane with a five-ton auxiliary hoist and a 10-ton electric crane. Steel is made in a 12½-ton acid open hearth furnace. The bench molding floors are located in a separate building, 36 x 100 feet. A large, car type, annealing furnace has been installed and a cleaning department, which occupies one end of the main building, is equipped with floor and swinging grinders, a Pangborn sand-blast with dust arrestors, oxweld torches, etc. The officers of the company follow: S. E. Doster, president; W. R. Gilmore, vice president; C. A. Pratt, secretary-treasurer.

News of Employers and Employes

Largest Gathering of Trade Unionists Ever Held in Birmingham, England, Listens Sympathetically to a Remarkable Address by the Lord Mayor

Bureau of *The Iron Trade Review*,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Sept. 10.

IN THE military arena the week has been one of steady progress without yielding anything of transcendent importance unless the dramatic and spectacular destruction of a Zeppelin be considered to deserve that description. War has been brought home to us in Birmingham in a very vivid and intimate way by a series of cinema pictures of the Somme battle. The obtaining of these was a brilliant exploit and the general result, in the minds of the many thousands who have seen them, is a deepening disgust for war. But, side by side with this is a stronger determination than ever to disable from future mischief the powers which have brought about this horrible catastrophe. No doubt Americans will have an opportunity of seeing the same wonderful exhibition. It shows very clearly that war is becoming too fearful a thing to be tolerated by mankind.

The week has been crowded with economic and industrial-social developments. We have had the trade union congress in Birmingham, by far the largest gathering of trade unionists ever held, the 668 delegates representing a membership of 2,850,457. The development of new points of view, through the progress of the war, has been a marked feature of the meeting. The trade unionists listened, apparently sympathetically, or at least without protest, to a remarkable address from the Lord Mayor of Birmingham, Alderman Neville Chamberlain, son of the author of tariff reform, in which the speaker argued for economic treaties with the dominions and our allies, a modification of the tariff system and such high production that the employers would secure the last ounce out of their plant and machinery in return for shorter hours and better wages. This sort of talk would have been treated as rank heresy three years ago by great numbers of trade unionists. It may possibly be, of course, that the glamor of a famous name had something to do with the favorable hearing given to the brilliant son of Joseph Chamberlain. Among the subjects dealt with by the conference, the most interesting was the proposal emanating from the American Federation of Labor for a conference having for its object the maintenance of international peace. The congress was informed that the object of the proposers was to include delegates from the central powers in the personnel of the meeting. Almost as a body the trade unionists showed themselves dead against any such proposal, and it is clear that this kind of internationalism must be regarded as dead for an indefinite period.

A substantial increase in British trade is reported today for the month of August. The imports for the month show an increase of £6,715,915, and the exports an increase of £15,281,468. It will be noticed that the increase in iron and steel and manufactures thereof is valued at £2,452,568. For the eight months the increase in imports is £53,035,709, while the exports are increased by £85,068,007. These figures tell their own story of British success in the maintenance of trade, and help to explain how the war bills have been paid.

New England Strikes

The first strike of organized labor in the machine industry of Greenfield, Mass., which started Aug. 17, was called off Friday at a meeting of the strikers with John A. Moffitt, commissioner of conciliation of the United States department of labor. The shops involved were those of the F. E. Wells & Son Co., three divisions of the Greenfield Tap & Die Corporation, and the Goodell-Pratt Co. Commissioner Moffitt found that the strike was uncalled for. The main demands of the men were for an 8-hour day with 10 hours pay, and time and one-half for overtime.

The strike at the General Electric Co., Pittsfield, Mass., is in its fourth week with prospects of a settlement through the efforts of the state board of conciliation and arbitration. Numerous conferences have taken place between officials of the company, a committee of the strikers and the state board and at the last one Friday the state board submitted a proposal of ground on which the company and the strikers could get together. The proposal is under consideration. The strike has not been without violent features, but no lives have been lost. There are approximately 5,000 men and women on strike for a 10 per cent increase in both piece work and day work, and other less important demands. The plant continues to run about 500 employes.

The strike of 600 machinists employed by the Westfield Mfg. Co., Westfield, Mass., which began Aug. 18, has ended and the men have returned to work.

The blacksmiths and forgers in the employ of the Concord Axle Co., Penacook, N. H., who have been on strike for an increase in wages, have returned to work, following a compromise arranged at a conference called by Rev. John J. Brophy, pastor of the Roman Catholic church.

Beginning Oct. 2 a 55-hour weekly schedule in place of the present 58-hour time will go into effect in three of the largest machine shops in Nashua, N. H., employing 700 men. No reduction in the weekly wages will be made. The shops are those of the Rolling Engine Co., the Flather Co., and the E. J. Flather Planer Co.

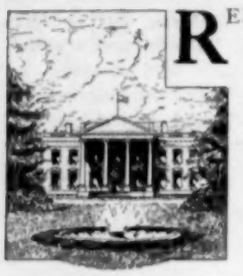
In retaliation for the suits recently brought by manufacturers of Bridgeport, Conn., against officials of the international molders union and their representatives in that city for $200,000 damages for alleged conspiracy in the strike situation, the Monumental Bronze Co., was on Friday made defendant in an action for a similar amount by three strikers. Two of the plaintiffs allege they were assaulted in pursuance of a conspiracy in behalf of the company and its officers. Each of the two asks $50,000 damages. Two of the three also allege fraudulent arrest, asking $50,000 each. About $65,000 belonging to the company and its officials are tied up in consequence of the suits.

The Sturtevant Aeroplane Co., Boston, has received an order from the United States war department for four combination land-and-water aeroplanes. The spars and main ribs are to be constructed of steel.

Business News of Nation's Capital

Keen Interest in Personnel of Boards Authorized by Congress— Salaries of Members May Be Raised— Significant Bids on Steel

Bureau of *The Iron Trade Review*,
206 Corcoran Bldg.,
Washington, D. C., Sept. 25.



REPORTS are in circulation here that an effort will be made by the administration at the next session of congress to have it modify that part of the legislation carried in the shipping act and the omnibus revenue act, so that the salaries of members of the shipping board and the tariff commission will be increased from $7,500 to $10,000 annually. Criticism from business interests against the lower salary has been so general that it is understood to have carried sufficient weight with the administration to have it ask that the salaries of members of the two boards be raised so that they will be on a parity with the salaries paid to such bodies as the interstate commerce commission and the federal trade commission, whose members are paid $10,000 a year. It has been insistently contended by business interests that men of the requisite qualifications would not be induced to serve on either the shipping board or the tariff commission at the low salary of $7,500 a year. The point has been made that the matter of the salary in itself might not prevent able men from serving on the board, but that men of the necessary business merit would be disinclined to serve on the boards at the low salary because of the fact that it would at the start have a tendency to discredit the standing of these two important organizations. The original provisions in both the shipping and omnibus revenue bills provided that salaries of members of the two bodies should be $10,000. But some over-sensitive members of congress felt that the salary they receive, $7,500 a year, would be sufficient for members of the shipping and tariff boards. In the rush to get the bills passed before congress adjourned, those supporting the higher salary provisions presented no united strength against the low salary advocates, and yielded to the latter in order to prevent any possible failure to enact the shipping bill or tariff commission legislation. Whether it is actually true that an effort will be made to increase the salaries remains to be seen, but the fact remains that it is believed such a movement is being planned.

Personnel of Boards

Interest is being shown in the probable personnel of the two boards. There is a division of opinion as to whether the President will make the appointments in the immediate future or will delay action for some time. It is generally thought the appointments will be made during the recess of congress.

The tariff commission act provides for six members, not more than three of whom shall be of the same political party. It is assumed that three of the members will be Democrats and the remaining number chosen from among the Republicans and Progressives. Numerous names have been mentioned as probable members of the commission. Among them are John H. Fahey, of Boston, former president of the chamber of commerce of the United States; Prof. F. W. Taussig, of Harvard University; Frank M. Halstead, chief of the customs division of the treasury department; Daniel C. Roper, former first assistant postmaster general under the present administration, and James B. Reynolds, secretary of the national Republican committee. Both Mr. Roper and Mr. Reynolds are actively engaged in the political campaign for their respective parties, and it is considered improbable that either will be named to serve on the commission.

The name of Bernard N. Baker, of Baltimore, formerly identified with steamship interests, is persistently mentioned in connection with the shipping board membership. Mr. Baker was a consistent supporter of the administration shipping bill, and is on intimate terms with Secretary of the Treasury McAdoo, whose recommendations with regard to appointments for the shipping board will no doubt carry much weight with President Wilson. The board is to be composed of five members. Another name mentioned is that of a vice president of a steamship company operating on the Atlantic coast, while a third concerns the name of a man who is an official of a steamship association of New York City. There is also a report of an unusual nature which has it that consideration is being given to a plan to transfer a member of a prominent government commission to the shipping board and to fill the vacancy such a transfer would create on the commission by appointing a member of congress who is chairman of an important legislative committee. This latter report is viewed with considerable doubt as to its accuracy.

Of the numerous criticisms made of the provisions of the shipping and omnibus revenue acts, one of the most vigorous relates to the so-called anti-dumping sections of the latter. It is contended by attorneys and others that they will prove ineffective. The chief point of attack is based on the fact that conviction for dumping goods into the United States is dependent upon the establishment of proof substantiating the charge that the importer in the United States had "commonly and systematically" brought in goods below the actual foreign market price and that his acts were done "with intent of destroying or injuring an industry in the United States".

It is contended that it would be difficult, if not impossible, for government attorneys to prove a case and obtain conviction under the law. It has been pointed out that cheap goods from abroad may be purchased by an importer with a view of selling them here in competition with the products of manufacturers of the United States, but his "intention" is only that of providing a profit through an amount of business, with no desire or expectation on his part to destroy or injure any industry in the United States. Going further, it is maintained that, even if the anti-dumping clause were made strong, foreign values would be sufficiently low to permit heavy imports into the United States under the present tariff act to undersell producers in the United States. This being so, great quantities of goods could be imported into the United States at its present tariff duties and would in no way violate any anti-dumping legislation, be it ever so strong.

This has been offered as one of many reasons why the tariff should be immediately revised upward. There

seems no possible chance of that being done, it is asserted, becaues President Wilson has said it is the opinion of the administration that economic conditions following the war would have to be studied first. The exception to this, however, relates to increased dyestuffs duties.

Without any design to involve politics into the discussion, it is only fair to point out as a statement of fact that, if the national administration is changed next March, protective tariff legislation would in all probability be taken up at once. But if the work of the tariff commission is to be awaited, it seems evident it would be a long time before it could make reports on its investigation abroad on which congress could base tariff legislation. It is assumed, of course, that the commission would not make its investigation as to industrial conditions until after the war, when the situation became normal or more nearly so than it can be under war conditions.

Carnegie Lowest

Washington, Sept. 26.—Out of a total of approximately 8,000 tons of plates, sheets, bars and shapes on which bids were opened at the bureau of supplies and accounts, navy department, on Tuesday of last week, the Carnegie Steel Co was the lowest bidder on all except about 300 tons. On two of the classes which included the latter tonnage, the Carnegie company did not bid. At the same time, it was the only bidder on some of the classes. In all, there were 10 bidders.

The bids, as a general thing, show the figures to have been about one third higher than those submitted on a similar material last December. The Federal Steel Foundry Co. of Chester, Pa., was the lowest bidder on approximately 75 tons of steel castings, at 9¼c per pound, delivery to be made in 180 days, while the American Steel Foundries was the lowest bidder on another lot of about 100 pounds of steel castings at 10c per pound, delivery to be made in 330 days. The Edgar Rogers Steel & Iron Co. submitted a similar figure on 24 tons of the latter lot.

The steel is for a fuel ship to be built at the Boston navy yard, involving a little more than 3,000 tons, and for a hospital ship to be built at the Philadelphia navy yard. These are the first ships in the big building program of the new naval act upon which bids for steel have been opened. Bids for the other vessels, to be constructed at private yards, will be opened at the navy department on Oct. 25, and include 64 in number.

Bids for steel for the fuel and hospital ships call for delivery at the navy yards. In each instance, the Carnegie company places the period of delivery at 300 days. Its figures ranged from 2.719c per pound on angles to 6.659c per pound on flat steel bars, based on standard specifications of the American Society for Testing Materials. A figure uniformly one mill per pound higher is named by this company for material based on navy department specifications.

While the tonnages involved are relatively small, the bids are considered to be of unusual interest because of the significance they may carry with regard to prices private ship yards will pay for steel for the vast tonnages they will need for the navy's building program. The delivery periods provided are also considered of particular interest for a similar reason, while the number of bidders is taken as proof of assurance from steel makers that they will give the government precedence over other customers, if necessary, in order that it will not be embarrassed by delays in completing its building program. Important bidders in addition to those submitting figures last week are expected to offer steel for the bulk of the building program.

The small tonnages on which companies other than the Carnegie company submitted figures were:

R. C. Hoffman Co., 30 tons of black rectangular steel sheets, 3.125 to five pounds per square foot, A. S. T. M. specifications, 0.033c to 0.034c, delivery 30 days; American Sheet & Tin Plate Co., 25 pounds galvanized rectangular steel sheets, 0.906 to 5.781 pounds per square foot, 3.98c per pound, A. S. T. S. specifications, delivery 100 to 250 days; American Pressed Steel Co., 30 tons rectangular ribbed plates, 12.5 pounds per square foot, in sizes up to 10 feet x 60 inches per pound, 4.08c, A. S. T. M., delivery 45 days, all of the foregoing material being for the fuel ship; Alan Wood Steel & Iron Co., 150 tons rectangular plates, five to 7.5 pounds per square foot, 3.30c per pound, A. S. T. M., delivery 90 to 180 days, for hospital ship.

The Carnegie bids, representing the remainder of the material, are as follows, being based on American Society Testing Materials specifications:

Fuel ship: 2,100 tons rectangular plates, 10.2 pounds per square foot and over, 3.099c; 600 pounds sketch plates, 10.2 pounds per square foot and over, 3.099c; 62 tons rectangular plates, 7.65 to 10.2 pounds per square foot, 3.199c; 27 pounds steel plates, 5.1 to 7.65 pounds per square foot, 3.349c; 550 tons angles, from 3 x 3 inches, 6.1 pounds to 8 x 8 inches, 26.4 pounds, 2.719c; 290 tons bulb angles, 7 x 3 inches, 18.3 pounds to 10 x 3.5 inches, 26.6 pounds, 2.999c; 210 tons channels, 4 x 1.58 x 1.58 inches, 5.25 pounds to 15 x 3.40 x 3.40 inches, 33 pounds, 2.699c; eight tons angles, 2¼ x 1½ inches, 3.66 pounds to 2½ x 2½ inches, 5.9 pounds, 2.829c; 75 tons bars, ⅝ inch square to 6 x ⅛ inches, 2.719c; seven tons hollow half-rounds, 2 x 1 inches to 3 x 1½ inches, 5.199c; nine tons tee bars, 3½ x 3½, 9.2 pounds, 2.749c; 39 tons I-beams, 18 x 7 inches, 75 pounds; 25-foot lengths, 2.799c; 28 tons H bars, 4 x 4 inches, 13.6 pounds, to 8 x 8 inches, 34 pounds, 2.799c.

Hospital ship: 360 tons rectangular plates, 10 pounds square foot, 3.159c; 110 tons sketch plates, 10 pounds square foot, 3.159c; 2,435 tons rectangular plates, 10.2 to 50 pounds per square foot, 3.059c; 650 tons sketch plates, 10.2 to 50 pounds per square foot, 3.059c; 295 tons rectangular plates, 7.65c to 10.2 pounds per square foot; 210 tons angles, up to 3 inches; 410 tons angles 3½ to 6 inches and 15 tons I-beams, 4 to 12-inch web, all 2.659c pound; 2,700 tons channels, 4 to 12-inch web, 2.909c; 23 tons hollow half-rounds, 1 12 x ¾ inches to 3 x 1½ inches, 5.159c; 85 tons flat bars, from ⅞ x ¾ inch up to limits of universal mill material, 3.659c; six tons flat steel bars 12 x 3½ inches, not over three lengths, 6.659c; 10 tons steel shapes of various sections and weights as may be required, 2.659c.

Bidders other than those mentioned in the foregoing included Barber & Ross; J. B. Kendall Co.; Richard H. Gray, Trumbull Steel Co., and Follansbee Bros. Co.

Proposed Schedules

Washington, Sept. 26. — Thought to have a connection with railroad tariffs filed with the interstate commerce commission proposing to cancel existing export rates on iron and steel products and substituting domestic rates, the Philadelphia & Reading railroad and connecting lines have filed a number of schedules increasing export rates on those products.

One tariff, filed to become effective Oct. 2, proposes a commodity rate of $2 per gross ton on billets, blooms, scrap material, etc., from Birdsboro, Chester, Harrisburg, Steelton and related points in Pennsylvania; Camden, N. J., and Wilmington, Del., to Newport News, Va. The tariff would replace existing class rates. Another tariff of the Philadelphia & Reading railroad, filed to become effective Oct. 26, applies from the same stations to Norfolk and Lambert's Point, Va. It is assumed that these new rates are to afford added port outlets for material going to belligerent countries and at the same time relieve the congestion at New York. The $2 rate to the Virginia ports, it is believed, would equalize rates applying to other ports.

Iron and Money: Fact and Comment

Speculation in Steel and Copper Stocks Whipped Into Turmoil in Wildest Stock Market Sessions Witnessed in Years

THE big bull market on the New York stock exchange seems to be gathering momentum each day and still the end is not in sight. The speculative stage is set with more propitious circumstances than ever before governed a stock market. Super-prosperity, with prices rising to inconceivable heights, prevailing simultaneously with a cheap money market, presents a combination rarely seen and at the same time for stock market achievement. The present is a market of realization, in contrast with the markets of anticipation last autumn and in other years. The arguments used in the past to put up prices in bull markets have been: "It will have a capacity to earn, and should accumulate and pay, etc." At present it is being said truthfully: "It is earning, it has accumulated and is paying."

All preceding bull markets have been interrupted by signals of distress and calls for help from corporations that suddenly found themselves in financial straits. Now dealers in bonds are complaining because of the paucity of new corporate issues. Few companies whose credit is good need money. Many are in a position to lend. Securities appear to be selling for less than the assets behind them would sell on the auction block. A score of corporations this year are earning a surplus on their common stocks which will amount to fully half of the market valuation of these stocks. Speculation in the steel and copper shares has been whipped into a turmoil by the active buying of raw material by belligerents. The recent contract for 448,000,000 pounds of copper, or one-quarter the annual production of all the mines in the United States, has furnished a sidelight on this activity, following, as it did, immense steel purchases. Another incentive to trading is found in the official August foreign trade figures. Exports from this country were shown to have crossed the half-billion dollar mark and the trade balance for the month made the new high record of $311,000,000.

Last Monday, in one of the most spectacular sessions the New York stock exchange has ever seen, sales exceeded 2,000,000 shares, the largest turnover in 10 years. United States Steel common, the bellwether of the stock market, reached 120, another new high record. At this price, the market valuation of Steel common was in excess of $600,000,000, as compared with about $430,000,000 only a little over a month ago and with $187,000,000 just before the stock exchange timidly ventured to reopen its doors toward the close of 1914. The vast appreciation is an index of the remarkable change which has taken place in industrial conditions since the war began.

The present market of realization may be carried too far, just as the markets of anticipation have gone in the past. The more conservative Wall Street interests are sounding warnings, yet their advice is far less pronounced today than it was a week ago, when speculation had not reached recent heights.

Quotations on a number of leading iron and steel and industrial stocks at the close of the New York stock exchange Sept. 23 and net changes for the preceding week are shown in the following table:

	Close Sept. 23.	Net chg.
American Can	65¾	— ⅜
American Can, prfd.	113½	+1½
Amer. Car & Fdy.	67¼	— ¾
Amer. Car & Fdy. Co., prfd.	117⅛	+1⅜
American Locomotive	79⅛	+1
American Locomotive, prfd.	106½	+1¾
American Steel Foundries	58	—1
Baldwin Locomotive	87¼	—2¼
Baldwin Locomotive, prfd.	106	...
Bethlehem Steel	538½	—16
Colorado Fuel & Iron Co.	55½	...
Continental Can	103½	—1¾
Continental Can, prfd.	110	+1¾
Crucible Steel	92⅝	— ⅝
Crucible Steel, prfd.	120¾	+1½
General Electric	174	+3¼
Gulf States Steel	93¼	— ¾
Gulf States Steel, 1st prfd.	100	+ ¼
Gulf States Steel, 2d prfd.	94	—2½
Internat'l Harv. of N. J.	118	+ ¼
Internat'l Harv. of N. J., prfd.	120	+2
International Harv. Corp.	78	...
International Harv. Corp., prfd.	109	+ ¼
Lackawanna Steel	85	+1
Nat'l. Enamel'g & Stmp. Co.	29⅜	...
Nat'l. Enamel'g & Stmp. Co. prfd.	95½	+2¼
Pressed Steel Car	60⅛	+ ⅛
Pressed Steel Car, prfd.	103⅜	+2⅛
Pullman Palace Car	166	—1
Republic Iron & Steel	67⅝	— ⅝
Republic Iron & Steel, prfd.	110⅞	+ ¾
U. S. Cast Iron Pipe & Fdy.	23	— ½
U. S. C. I. P. & Fdy., prfd.	55	.....
United States Steel	117	+9¼
United States Steel, prfd.	121¼	+1⅛
Westinghouse Mfg. Co.	64	+ ½

Maximum quotations for a number of iron and steel securities not listed on the New York stock exchange, as of Sept. 22 and Sept. 15, compare as follows:

	Sept. 22.	Sept. 15.
American Radiator	400	400
American Ship Building	49½	49
Cambria Steel	81½	...
Chicago Pneumatic Tool	74½	76½
LaBelle Iron Works	62	60¾
Lake Superior Corp'n	14⅞	13⅞
Stewart-Warner Speed. Co.	114	116
Warwick Iron & Steel	9¾	...
Westinghouse Air Brake	155	150
Westinghouse Elec. & Mfg. Co.	65¾	64¾

Carbon Steel Declares Dividends

The Carbon Steel Co., Pittsburgh, is about to pay dividends on its second preferred and common stocks—for the first time in more than 10 years. Directors took action last week, declaring a disbursement of 6 per cent on each issue, payable Sept. 30, to stock of record Sept. 25. A dividend of 8 per cent was declared on the first preferred about a month ago. The first preferred is a non-cumulative stock. It paid regular dividends of 8 per cent for a number of years up to and including 1908. Payments then were suspended and not resumed until the present movement. The Carbon Steel Co. had, at the beginning of 1916, an annual ingot capacity of about 150,000 tons.

The capitalization of the Carbon Steel Co. at the first of this year was as follows: First preferred stock, $500,000; second preferred stock, $1,500,000; common stock, $3,000,000; funded debt, $700,000. All shares have a par value of $100. The stocks are traded in on the New York curb, but they have been very inactive this year. No sales of the first preferred have been made on the curb this year. Only one sale of the second preferred is noted; this took place in February and the price was 58. The common has seen only slightly greater activity. It opened the year at about 65, later declining to a low of 60½. The high quotation for Carbon Steel common this year is 90, while the last sale took place at 88. From the record of curb transactions it is evident that the Carbon Steel shares are closely held and that most of the old stockholders are about to reap the fruits of their waiting.

Pittsburgh Steel Profits Large

Figures made public in the annual report of the Pittsburgh Steel Co., covering the fiscal year ended June 30, contrast strikingly with those of previous years. Gross sales for the

year were $21,848,036, as compared with $11,649,864 in the fiscal year ended June 30, 1915; net earnings were $4,564,067, as against $858,160 in 1915. Following is a comparison of the gross sales and net earnings of the Pittsburgh Steel Co. in each of the past seven years:

1916	$21,848,036	$4,564,067
1915	11,649,864	858,160
1914	11,024,693	416,550
1913	11,520,842	1,255,812
1912	11,649,149	1,267,252
1911	11,774,356	1,311,554
1910	11,670,918	1,140,743

Fell Behind

In Making Deliveries and Contract Has Been Transferred.

New York, Sept. 25.—Transfer by the Eddystone Ammunition Corporation to other parties of a large munitions contract for the Russian and French governments, reported to aggregate $40,000,000, has been effected. According to the reports that have been in circulation, the Eddystone Ammunition Corporation has met with difficulties, through changes in specifications, and other causes, in the completion of this contract, and has run far behind in its deliveries. Alba B. Johnson, president of the Baldwin Locomotive Works, who is actively interested in the Eddystone company, has issued the following statement on this matter:

"The announcement that the Baldwin Locomotive Works is to take over the management of the Eddystone Ammunition Corporation's contracts with the British government does not accurately express the situation.

"The stock of the ammunition corporation has been acquired by the Anglo-Russian Commission, which will designate the board of directors. The corporation itself continues its corporate existence and its lesseeship of the buildings which have been constructed for its use, and is to continue to perform its contracts."

The Eddystone Ammunition Corporation was formed a year or more ago, with Samuel M. Vauclain, vice president of the Baldwin Locomotive Works, as its president, for the purpose of manufacturing ammunitions for European governments. Under an arrangement with the Baldwin Locomotive Works, the latter erected at Eddystone, Pa., large buildings for the use of the munitions company and leased the land and plant to the latter for a fixed sum for a royalty on each shell turned out. Buildings also were erected under a similar arrangement with the Remington Arms Co. of Delaware. Under these agreements the buildings are to revert to the Baldwin Locomotive Works when they shall have filled their purposes of munition manufacture.

Financial Crop Ends

The filing of the will of Miss Lyra Brown Nickerson, Providence, R. I., who left an estate estimated at $3,500,000, discloses the fact that stock of the Brown & Sharpe Mfg. Co., of that city is valued at $25,000 a share.

* * *

The official completion of the merger of the Warner Mfg. Co., Toledo, with the Chevrolet Motor Co., New York City, will take place Oct. 1. No changes in organization will be made. The present officers are: President and general manager, Thos. W. Warner; secretary and treasurer, E. S. Janney, and general superintendent and factory manager, G. D. Moore.

* * *

The Scripps-Booth Corporation, recently organized to acquire and operate the Scripps-Booth Co. and the Sterling Motor Co., both of Detroit, has elected the following directors: C. H. Booth, president; W. H. Little, N. J. Miller, W. L. Scripps, F. J. Sesenbrenner, Alfred P. Sloan Jr., and T. P. Warner. The new corporation starts business with $1,250,000 in net quick assets.

* * *

The directors of the Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., have declared a regular quarterly dividend of 4 per cent and extra dividends of 12½ per cent, thus placing the stock on a 66 per cent per annum basis. The dividend disbursement which amounts to $412,500, is payable Oct. 2 to stockholders of record Sept. 16. The company's stock is quoted at 875 and 880, the highest point in several months. It was above 900 about a year ago.

* * *

A deed for $1,275,000 has been placed on record in Reading, Pa., conveying the Temple blast furnace, near there, from George A. Coulton, of Cleveland, to the Seaboard Steel & Manganese Co. Mr. Coulton held the blast furnace, an independent plant, as trustee for other interests. The Seaboard company is now a combination of this furnace and a Virginia manganese plant, and W. R. Hopkins, of Cleveland, is interested. For improvements to the Reading plant the Seaboard will spend $700,000. A mortgage for $1,000,000 is being given by the Seaboard company to the Metropolitan Trust Co. of New York, securing an issue of 6 per cent 2-year notes.

* * *

The annual report of the American Rolling Mill Co., Middletown, O., shows net profits for the year ended June 30 of $3,101,512, after allowing for all expenses, including $950,876 for maintenance and $171,600 reserved for extraordinary renewals. The surplus as of June 30 was $4,415,239. George M. Verity, president of the company says in his report that five plants are operating at their fullest capacity and that orders booked insure full operation to the end of the fiscal year in 1917. The American Rolling Mill Co. has outstanding $6,400,000 common and $800,000 6 per cent cumulative preferred stock.

* * *

Stockholders of the J. E. Bolles Iron & Wire Works, Detroit, have approved increasing the company's capital stock from $150,000 to $500,000. A stock dividend of 20 per cent will be issued to holders of the common stock now outstanding. E. B. Newton has been added to the board of directors. The company recently purchased a site and will erect a plant to manufacture ornamental iron. Contracts now are being placed. The present plant in the central part of Detroit will be sold or converted into a loft building. Directors are: J. E. Bolles, E. B. Newton, Adam Kolb, J. B. Mansfield and Alfred J. Jones.

Large Extensions

Toronto, Ont., Sept. 25.—Sir Adam Beck has announced that the provincial hydro-electric commission has decided to spend $1,300,000 at once in duplicating its transmission line, with an additional double circuit line from Dundas to Toronto, Ont. All plans and specifications have been completed and the work of acquiring the right of way is being proceeded with. The Toronto station will be doubled and the Dundas, Ont., inter-switching station will also be duplicated. The Niagara Falls, Ont., station is to be increased so as to take care of 50,000 horsepower now available; 25,000 horsepower of which is being supplied at the present time. It is expected that the maximum load for this year to meet requirements of the Niagara district will be between 140,000 and 150,000 horsepower.

Will Double Capacity

The Imperial Brass Mfg. Co., 1200 West Harrison street, Chicago, will start construction within the next two weeks on an addition to its plant which will double its floor space, giving the company a total of 150,000 square feet. The new building will be of heavy mill construction and will be located on the site adjoining its present plant. Bids are now being taken for the building work. Orders for the new factory equipment have already been placed. The new foundry space will be more than double the present space. The Imperial Brass Mfg. Co. manufactures brass specialties and has been running night and day for many months without doing any war business. It expects to be able to fill the new plant to capacity, as soon as it is placed in operation.

The Bristol Brass Co., Bristol, Conn., is building a one-story, 320-foot long rooming house on Broad street, that city, for the accommoda- of employes who have been living in tents during the summer months. The house will be equipped with all modern conveniences, including baths for each suite of rooms. The company maintains a large restaurant near the building.

American Steel is Badly Needed

But High Ocean Freights Restrict the Movement to England—Blast Furnace Operators Open Their Books and Come to Terms With the Ministry

Bureau of *The Iron Trade Review*,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Sept. 10.

THE muddle in the Derbyshire pig iron prices, already described, has not been without a certain Gilbertian dash of humor. The absurd situation in which whole counties were disorganized, through the mulish refusal of a smelter to exhibit his books, is now at an end, and this particular obstructionist must have had a very rough time from his conferees, whose cumulative pressure may account for his capitulation. Apparently, an inkling of what was to come accounted for the confident prophecy a week ago that the struggle would be brief. The Derbyshire owners of blast furnaces met on Friday last, and were able to satisfy the ministry of munitions that the government demand for the exhibition of cost lists could no longer be resisted. They urged also the desirability of a prompt settlement, in view of the deadlock, affecting not only Derbyshire, but Northamptonshire, Staffordshire and other counties, and on Saturday morning the firms concerned had the gratification of receiving from the ministry a telegram confirming the advance of five shillings promised them on July 19 and making that rate retrospective upon all contracts carried through since that date. Peace between the smelters and the ministry, therefore, once more prevails, and a certain amount of buying and selling is in progress. There is, however, very little speculation and pig iron purchasers scarcely go beyond week to week supplies. Indeed, dealers make a kind of grievance over the fact that the buying and selling of iron and steel is now such a humdrum business that the old speculative zest has disappeared.

The notorious scarcity of pig iron has been by no means relieved. In the north of England the control committee sets its face against forward business. Nobody is allowed to accumulate stocks, and the ordinary buyer who cannot plead war requirements is more and more squeezed out of the running. More Cleveland furnaces have been gotten ready for a re-start, but, so far, the requisite labor has not been forthcoming, and makers appear to be dependent upon the expected return of men from the army not yet effected. Some confidence is expressed that, by the end of the month, these men may be available. The stocks of ordinary pig iron in Middlesbrough are now down to 16,000 tons, a reduction on the month of 7,000 tons. The shipments for August were about 55,000 tons. It will be seen that consumers will soon have to reckon without the public stores, which are approaching the vanishing point. Hematite pig iron is nearly unobtainable, and there is a great scramble for any stray lots that may be snapped up. French consumers are able to take advantage of the government home rate of 122s 6d ($29.40), but the nominal foreign quotation is 140s ($33.60). The price is practically immaterial, because no new licenses for export are being granted.

Finished Iron and Steel

At the present rate of progress, the whole of the iron and steel business will soon be flowing into war channels. Notwithstanding the constant increase in munitions, there have been most important additions lately to the list of controled establishments, which now reaches the remarkable total of 4,212, covering all industries in any way contributing to the war. All the businesses of any magnitude in the chief metal-working industries are now included. But still more restrictive of outside trade is the series of controling regulations discriminating, in regard to all orders accepted. Every order offered must set forth the purpose for which the material is required, and there is now an elaborate classification, embodying at least a dozen divisions, determining the relative importance of every order. The government is determined to secure the speediest output of goods most urgently needed. While this, to some extent, helps forward war production, it involves a serious curtailment of the opportunities for general trade.

There is great dissatisfaction over the practical impossibility of bringing in American steel, in any serviceable quantity. The enormous freightage of £6 ($28.80) per ton is practically shutting out wire rods and billets. A few of the latter are being taken by those firms which must have material, regardless of price; but as a rule, this brings the metal to an impossible figure, even in the present days of steel hunger. A number of wire mills in Birmingham are in sight of stoppage for want of rods. Apparently, American makers are not now offering billets in any quantity. Fair lots of discard steel are on offer, but in view of the absence of guarantee, and the uncertain character of this material, there is no inclination to buy it and, in the main, it goes begging. A great deal of the abuse levelled at the shipping industry is based upon the very high freights, which are said to be keeping out very much material. After their numerous disappointments in seeking supplies, many consumers have now given up in disgust any further efforts in this direction. They are patriotic enough not to dispute the priority of war claims and they recognize at all events that their competitors in this country at least are doing no better than themselves. A considerable moderation of freights, enabling these people to buy American steel, would bring nothing less than salvation to their industries.

One effect of the restriction on the manufacture of tin plates is a rise in values. This trade is under a cloud, and makers are not very happy in the spectacle of their business slipping away, as the result of foreign competition and the determination of the government to discourage all production not having a direct relation to the war. A considerable number of the tin plate rollers will be drafted into the steel works, where the influx of their labor will be very welcome.

The process of absorbing German works steadily continues, although, as a rule, it is only the passing of great establishments which is made public.

Henry A. Hitner's Sons Co., Philadelphia, is the successful bidder on two bridges over the Susquehanna river, offered for bids by the Philadelphia & Reading railroad. One at Milltown, Pa., is about 2,000 feet long, and the other at Sunbury, Pa., about 3,600 feet long. The Hitner Co. immediately will begin dismantling the super-structure.

The Keystone Rubber & Tire Co., Inc., Keystone building, Pittsburgh, will build a plant, 60 x 190 feet, at Penn Station for the manufacture of automobile truck tires.

Heavy Shipments

Are Being Made from Hibbing—Some Interesting Developments

Hibbing is having a wonderful season with heavy shipments. The Oliver Iron Mining Co., due to a large demand for its ore and somewhat to labor conditions, which have caused a decrease in shipments from their underground mines, is shipping more from its pits than ever before and every shovel in the district is busy removing ore. The Hull-Rust pit will have its largest shipments to date. In 1913 this mine produced 3,400,000 tons. How much the present season will exceed that, is now not known, but it is known that the Hull-Rust will set a new shipping record for the Mesabi range and for the entire United States. Nine shovels are at present at work night and day in the great pit, which extends over 320 acres. The Oliver company also began shipments last week from the Kerr mine, a new property. Stripping at this mine was practically finished some months ago. It is an open pit, about one-half a mile long and 600 feet wide, and the ore body is a continuation of that of the Mahoning.

To the east of Hibbing at the Webb mine of the Shenango Furnace Co., interesting operations are in progress. The work there consists of washing or concentrating certain of the ore from the underground workings. The formation on the Webb forties varies somewhat from the rest of the Hibbing district. The deeper the ore is found, the larger is its silica content, and the plan of the company is to concentrate certain portions of its production with a view towards bringing up the analysis of all of its shipments. The plant is a simple one and housed in a steel structure, which is attached to the shaft house. The machinery is of Allis-Chalmers manufacture and consists of one 10-foot circular revolving screen or trommel of 2-inch perforations, a 25-foot log washer, an 18-foot turbo and three-pyramid classifiers. The water used is conducted through a series of ditches far away from the property while the sand is taken from the tailings by a dewatering and drag process and dumped on a conveyor belt and conducted 400 feet away on a tailings stacker, to the caves from the old underground workings. The plant has a capacity of about 75 tons per hour. Last week was the first time that the plant had done real service as much of the time since its erection, some weeks ago, has been spent in experimentation. In certain cases, however, the silica content has been reduced as much as 15 per cent and, of course, with this reduction there has come a large increase in iron content.

The Webb property consists of three 40-acre tracts. One is already developed and another 40 will be developed underground and its ore trammed to the present shaft. The south 40-acre tract is at the present time being stripped and one shovel is engaged in this work by the Winston-Dear Co., contractor. The pit will adjoin the Susquehanna of the Rogers-Brown Co. and the sellers of the Oliver Iron Mining Co. and the development of these properties makes the mining region immediately east of Hibbing a very interesting one.

Pyrites Cinder

In Large Quantities to be Sintered for Blast Furnace Use.

An interesting operation for the sintering for blast furnace consumption, of a large accumulation of pyrites cinder is being carried on by the Merrimac Chemical Co. at its plant at South Wilmington, Mass., 16 miles distant from Boston. This company is converting a stock of 75,000 tons of pyrites cinder into a low phosphorus material, analyzing about 65 per cent in iron and 0.01 per cent in phosphorus through the Dwight and Lloyd sintering process. One unit, with the capacity of 200 to 250 tons a day and fitted completely with crushing and screening equipment, is in operation. This plant was installed by the engineers of the American Ore Reclamation Co. and the Stone & Webster Engineering Corporation supervised its installation. The Merrimac Chemical Co. is a large manufacturer of chemicals and has been stocking for several years the pyrites cinder which is the residue of the large tonnage of Rio Tinto Spanish pyrites used in its operations.

The American Ore Reclamation Co. also is installing a one-machine plant at Swedeland, Pa., for the Alan Wood Iron & Steel Co., which will have a capacity of 150 to 170 tons a day when working on flue dust and 200 tons working on fine ore. Eventually the company purposes to screen its fine ore, sending the coarse to the furnace direct and the fine to the sintering plant. The Swedeland machine will be served from an overhead storage bin which will be filled from a slow-speed bucket elevator. An installation similar to that at Swedeland is being made for the Low Moor Iron Co., Low Moor, Va., consisting of one machine of 200 tons daily capacity when working on ore. The Virginia Iron, Coal & Coke Co. also has under construction at East Radford, Va., a 200 ton machine for the sintering of flue dust, pyrites, cinder and ore.

Toluol Buying

Is Not Very Active—Benzol Production Equals Demand.

New York, Sept. 26.—Buying of toluol on any important scale still is lacking and prices are poorly defined. Spot business monopolizes the trading. Large sellers quote spot firmly at $3.50 per gallon, but others are accepting $3.25. No contracting to speak of is being done leaving forward prices a matter of individual opinion. Manufacturers of trinitrotoluol are not booking the large explosive contracts from foreign governments they entered a year ago. They may be able to do this later. Such sales at present are of a scattered character.

The benzol market is well balanced as the production continues just about to match the demand. Some dealers and producers, however, still accept 60 cents per gallon for spot, and a number of such lots were closed the past week. For both spot and contract, the market is quoted from 60 to 70 cents per gallon. Contracting is not active. Phenol is strong with an upward trend of prices. For spot, 60 cents per pound is being done and 55 cents also has been accepted. The demand is good. After having had a very irregular course in recent months, selling as low as 50 cents, and as high as $1.75 per pound, it looks as if the market is slated for an advanced level. Solvent naphtha is easy with offerings plentiful. Prices are unchanged.

Spot and nearby sulphate of ammonia is rising steadily and is quoted from $3.70 to $3.75 per 100 pounds at tidewater or slightly higher than last week. Makers are sold up for several months and the early supply is limited.

Market Prices for Coke Oven By-Products

Spot.

Per Gallon at Producers Plant.

Pure benzol	$0.60 to .70
Toluol	3.25 to 3.50
Solvent naphtha	.35

Per Pound at Producers Plant.

Phenol	$0.55 to .60

Per 100 Pounds at Seaboard.

Sulphate of ammonia	$3.70 to 3.75

Contract.

Per Gallon at Producers Plant.

Pure benzol	$0.60 to .70
Toluol	3.00 to 3.50
Solvent naphtha	.30 to .35

Per Pound at Producers Plant.

Phenol	$0.60

Per 100 Pounds at Seaboard.

Sulphate of ammonia (nearby)	$3.70 to 3.75

The Pittsburgh Crucible Steel Co., Pittsburgh, on Sept. 15 broke ground at Midland, Pa., for two additional open hearth steel furnaces, having capacities of 80 tons each. When the new furnaces are completed the company will operate a battery of 12 open hearth furnaces.

Single Tools Buoy Week's Business

Heavy Machines Find Broader Market and Are in Demand—Crane Sales Limited by Long Delivery Clause But Some Good Inquiries Are Out—Good List in Cleveland

BUYING of miscellaneous tools by domestic users continues to improve in the eastern machinery market. Orders, involving one to six tools, are being booked in good volume, calling for both new and second-hand machines. Export demand is somewhat slower, and it appears that France and Russia are the biggest buyers at the present time. Within the last few days it is understood that a number of lathes have been placed for shipment to these countries. It develops that the business in the lathe market during the past month has tended strongly to the heavier machines, weighing perhaps 10,000 pounds more than the lathes which have been extensively used in the past. This change is due chiefly to the larger shells, eight to nine inches in diameter, now being heavily employed by the warring countries.

The situation in the eastern machine tool market as a whole, however, is comparatively quiet. This condition is due mainly to the difficulty in getting nearby deliveries. The crane market remains dull with a fair amount of inquiries but only an occasional order placed. Included in the current business, is an order booked by a Cleveland builder for a 7½-ton crane for the plant of the American Steel & Wire Co., Worcester, Mass. The McMyler Interstate Co., Bedford, O., is understood to have submitted the low bid on a locomotive crane for the Charleston navy yard, its tender being $11,075. The Crucible Steel Co. of America, Pittsburgh, has inquiries out for a 15-ton crane. Perhaps the biggest inquiry before the crane market at this time is that of the United States government which calls for a 250-ton pontoon crane for the Mare Island navy yard on the Pacific coast. As bids will be closed Nov. 11, it is thought the order will not be placed much before the end of the year. The crane is expected to cost at least $1,000,000, and will be approximately the same size as the two German-built pontoon cranes, one of which collapsed several years ago in Panama, when placed in operation.

The railroads now are showing more interest, and although no large lists are noted, inquiries are coming out in somewhat better volume. Among the recent buyers is the Baltimore & Ohio railroad, which has just closed on a number of hydraulic wheel presses, also several car-wheel lathes and driving-wheel lathes.

The American Can Co., 120 Broadway, New York City, has awarded the contract for a $1,000,000 plant at Seattle. The New York, New Haven & Hartford railroad is receiving bids for a roundhouse and repair shops, costing $65,000, at Danbury, Conn. The Anderson Pneumatic Tire & Spring Co. will start work shortly on a $30,000 plant at Washington, D. C. The W. E. Wood Co., Detroit, is taking sub-bids on a $20,000 addition to the plant of the Chevrolet Motor Co., New York City. The Interstate Machine Co. will erect a $6,000 plant at Troy, N. Y. The Bay State Metal Corporation, Brockton, Mass., plans to build a $30,000 plant. The Baldwin Chain & Mfg. Co. plans to expand its plant at Worcester, Mass. The Bernstein Mfg. Co., Philadelphia, will make alterations and additions to its foundry. The Cluett, Peabody Co., Troy, N. Y., has plans in progress for a plant, costing $1,500,000.

Sales Drop in Chicago

A LULL seems to have come over the machine tool market in Chicago. This is thought to be temporary, but has reduced selling to a much lower point than has been experienced for several months. In spite of this, there is an unsatisfied demand for certain lines of tools which are scarce and if they could be furnished, the trade would be improved. This demand includes grinders, milling machines, some types of drills and large lathes. Few 14-inch lathes are available.

A peculiar development of the tool situation is the fact that scarcely a manufacturer in this country is now making foot-power lathes. This is believed to have resulted from the fact that prices have risen too high for this class of buyers and that most lathe makers prefer to use their facilities for producing power-driven tools.

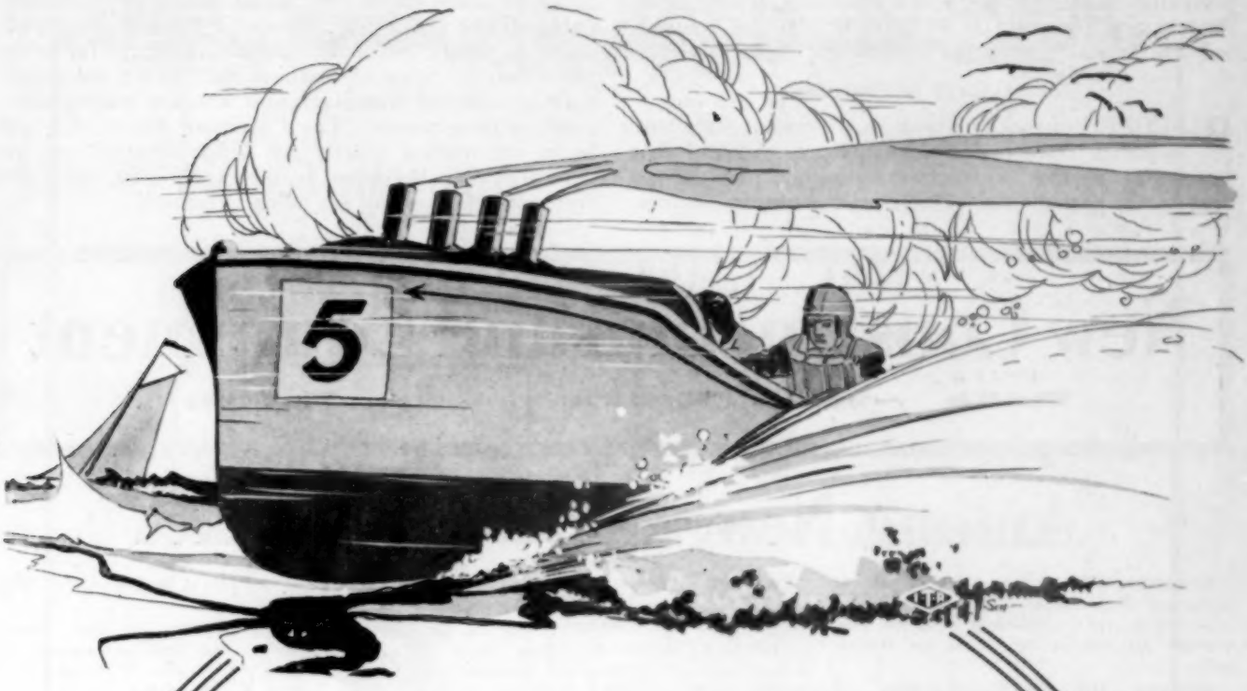
Foreign demand has almost disappeared and no large inquiries from domestic users are now in the market. Sales of single tools and small groups are being made steadily and business would be considered fair if it did not have a background of much larger proportions for comparison.

Business Booming in Pittsburgh

THE railroads, manufacturing concerns of many kinds and foreign interests are active factors in the Pittsburgh market for machine tools and heavy rolling mill equipment. The Pennsylvania railroad will probably close within the next 10 days for the miscellaneous line of tools, previously mentioned by *The Iron Trade Review*. The Baltimore & Ohio railroad is in the market for several steam hammers, a number of engine lathes and a heavy duty press, and the Pittsburgh & Lake Erie railroad is negotiating for a large punch and shear. The Carnegie Steel Co. is buying coal-handling equipment and a number of machine shop tools for its by-product plant at Clairton, Pa., and the National Tube Co., Pittsburgh, has been an active factor in the market recently. Builders of rolling mill machinery report they are being called upon for blooming mill, plate mill and bar mill equipment and engines for shipment to Japan, Russia, France, England, Spain and Italy. Because of inability to meet specifications for delivery, however, inquiries for export are not receiving much attention.

Good List Appears in Cleveland

CLEVELAND dealers were notified last week of a 10 per cent increase in the price of planers and shapers, built by Ohio manufacturers. This price change will be effective Oct. 1. Tools manufactured by eastern builders have not as yet been increased. It is rumored among Cleveland dealers that boring mills and lathes will be increased within the next 10 days. An important list which appeared in the Cleveland market is that issued by the National Tube Co., Pittsburgh, for its Lorain plant. The list includes the



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Cleveland Office: Hickox Bldg., The Hamill-Hickox Co., District Representative
Chicago Office: Room 1511-12 Lytton Bldg., 14 East Jackson Blvd., A. Schaefler, District Representative
Philadelphia Office: 902 Widener Bldg., Frank Wallace, District Representative

following tools: Lathes, screw machines, boring mills, slotters and planers. It is believed that the business will be placed through the Pittsburgh office.

Market Slack in Cincinnati

BUILDERS of machine tools in Cincinnati state that inquiries from munition plants are low, and that business from that source has diminished over 50 per cent in the past month. Orders taken during September were below those for August, while July exceeded either of the previously mentioned months. Railroads continue to buy, but inquiries from them are far below the average. Sales of machine tools today are principally to domestic manufacturers who are making additions to their plants. The Cincinnati Planer Co. will be in the market shortly for a list of tools not yet determined, to be placed in a new addition, 40 x 200 feet, for which plans are being prepared.

New Construction and Equipment

What it is **Where it is** **Who's doing it**

Among New England Factories

BANGOR, ME.—Bids have closed for a brick and steel, fireproof, 3-story and basement, 78 x 195-foot business block to cost $100,000 for Charles W. Morse on Harlow street.

BREWER, ME.—The Eastern Mfg. Co. will build a brick, mill-construction, 2-story, 45 x 94-foot office building to cost $20,000.

PORTLAND, ME.—The General Appliance Co. has been incorporated to do a general manufacturing business with $50,000 capital by George W. Bounton, Dover, N. H., Wallace L. Barker, Somerville, Mass., and A. E. Gorham, Wiscasset, Me.

SOUTH PORTLAND, ME.—E. C. Richards & Co. have plans for a 2-story, 58 x 210-foot factory building and garage costing $30,000.

MILTON, N. H.—I. W. Jones, engineer, is receiving bids for a $100,000, 1-story power plant, 32 x 80 feet.

NASHUA, N. H.—The Amoskeag Realty Co. will build a brick, 3-story, 70 x 153-foot business block on Main street.

BOSTON.—The Peninsula lodge, I. O. O. M., will build a brick, 3 or 4-story building to cost $80,000 in South Boston.

BOSTON.—The New York, New Haven & Hartford railroad will build a 1-story, 60 x 200-foot addition to its round house on Dover street.

BOSTON.—Eugene N. Foss will build a reinforced concrete, 3 and 4-story and two basements, 60 x 300-foot factory building at Newbury street and Brookline avenue.

BOSTON.—The Whiton & Haynes Co. has been awarded a contract by the city for a brick, 2-story, 72 x 152-foot, 16-room school to cost $150,000 at Gibson and Bispham streets, Dorchester, Mass.

BOSTON, MASS.—Plans are being prepared for a $37,500 addition to the air compressor plant at the Boston navy yard. Address F. R. Harris, chief of bureau of yards and docks, navy department, Washington.

BROCKTON, MASS.—The Bay State Metal Corporation has awarded a contract for a brick, 1-story, 65 x 160-foot factory building, a 1-story, 32 x 43-foot office building and a 38 x 24-foot boiler house to cost $30,000 on Meadow lane, Campello, Mass.

CAMBRIDGE, MASS.—The Concrete Steel Products Co., Boston, has awarded a contract for a sheet iron, 2-story, 65 x 120-foot warehouse on Monroe street.

CANTON, MASS.—The Plymouth Rubber Co. will build a brick, fireproof, 3-story, 70 x 100-foot hotel on Washington street.

CHELSEA, MASS.—Bids have closed for a brick and stone, 3-story and basement, 80 x 200-foot school to cost $175,000 for the city of Chelsea.

CHICOPEE, MASS.—The National Scale Co. is building a concrete, 2-story addition to cost $30,000 to its factory at Gratton and Montgomery streets.

EVERETT, MASS.—The Everett Factories Corporation has awarded a contract for a brick, mill construction and steel, 4-story, 167 x 148 x 124-foot factory to cost $60,000 at Charlton street and Broadway.

FALL RIVER, MASS.—The Fall River Bleachery will build a stone, 1-story, 79 x 200-foot addition to its plant on Jefferson street.

FALL RIVER, MASS.—The Bay State Shellac Co. has awarded a contract for a brick, 1-story, 49 x 116-foot factory building with an ell, 37 x 60 feet, at 884 South Main street to replace one recently destroyed by fire.

FRAMINGHAM, MASS.—The F. S. Carr Rubber Co. has awarded a contract for brick and concrete, 1-story, 60 x 160-foot and a 35 x 100-foot factory buildings on Irving street.

LOWELL, MASS.—The Massachusetts Cotton Mills has awarded a contract for a brick, 2-story and basement, 64 x 291-foot factory building to cost $40,000 on Canal street.

NEW BEDFORD, MASS.—The Acushnet Mills have awarded a contract for a brick, 4-story, 50 x 175-foot addition.

NORTH ANDOVER, MASS.—The Brightwood Mfg. Co. is building a brick, mill-construction, 1-story, 76 x 140-foot mill.

READING, MASS.—The United States government will build a brick and stone, 1-story and basement, 50 x 76-foot post office building to cost $55,000 and will call for bids in December.

SOMERVILLE, MASS.—The Sprague-Hathaway Co. has awarded a contract for a brick, 4-story, 88 x 103-foot factory to cost $20,000 on Day street.

SOMERVILLE, MASS.—The Vacuum Co. has awarded a contract for a steel and iron, 1-story, 72 x 110-foot factory to cost $35,000 at 105 Mystic avenue.

WATERTOWN, MASS.—Bids have closed for a concrete, 1-story, 144 x 450-foot tire building for the Hood Rubber Co. in East Watertown.

WORCESTER, MASS.—The Smith Heating & Ventilating Co. has been incorporated with $10,000 capital by Nicholas J. Smith, G. A. Quinn and H. L. Woodward.

WORCESTER, MASS.—The Wachusett Thread Co. has awarded a contract for a brick, 2-story, 50 x 76-foot addition to its factory on Middle River road.

WORCESTER, MASS.—The Bunnell Co. has been incorporated to manufacture machinery with $10,000 capital by H. A. Konderman, George W. Bunnell and T. B. Bunnell.

WORCESTER, MASS.—N. R. Thibert & Sons have purchased the Molt Bros. dye works in Millbury, Mass., and will establish a plant for the manufacture of tools, specializing in punches and dies, for which it is said $125,000 worth of machinery has been ordered.

WORCESTER, MASS.—The Baldwin Chain & Mfg. Co. has leased a 4-story building now under construction for the Worcester Cold Storage & Warehouse Co. The new plant will be equipped with the heavy machinery and presses in use at its Chandler street plant in this city, and it is expected that additional machinery will be acquired. The Chandler street plant will be used for the manufacture of lighter products.

CENTERVILLE, R. I.—The Warwick Mills have awarded a contract for a brick, 2-story, 112 x 250-foot weave shed.

NARRAGANSETT PIER, R. I.—John H. Hanan, New York City, will build a brick, fireproof, 3-story hospital to cost $50,000, which he will present to the town.

PAWTUCKET, R. I.—The Anchor Webbing Co. has awarded a contract for a brick, 1-story, 26 x 130-foot addition to its mill on Brooks street.

PROVIDENCE, R. I.—The Darrow-Mann Co., Boston, will build a steel, 38 x 235-foot, 30-foot high coal pocket, at Field's point, R. I.

PROVIDENCE, R. I.—James C. Doran & Sons have awarded a contract for a brick, 1-story, 27 x 67-foot machine shop on Bassett street.

PROVIDENCE, R. I.—The American Emery Wheel Works has awarded a contract for a brick, 3-story and basement addition to their main building on Waterman street.

Ingot Talks with

ROLLING MILL JIM

If any of you Forge Shop fellows want some Mayari Steel Forging Ingots, sand cast, for immediate delivery, better get in touch with Hubbard.

So long—

Rolling Mill Jim.

Hubbard Steel Foundry Co.

EAST CHICAGO, IND.

All Kinds of Iron and Steel Rolls and Steel Castings.

Say you saw it in THE IRON TRADE REVIEW

PROVIDENCE, R. I.—The American Ring Co. has changed its corporate name to the M. Winograd Son Co., Inc., and reduced its capital stock from $25,000 to $10,000.

ANSONIA, CONN.—Plans have been completed for the erection of a foundry at Ansonia. Address Ansonia chamber of commerce, care H. C. Fosdick.

BRIDGEPORT, CONN.—The Electric Cable Co. has plans for the erection of a plant at Bridgeport. Fletcher-Thompson are the architects.

BRIDGEPORT, CONN.—The Off-set Tool Co. has been incorporated with $25,000 capital by D. J. Trivers, Cyrus Barker and William J. Brickley.

BRISTOL, CONN.—Bids have closed for additional buildings at the plant of the New Departure Mfg. Co. The structures include a brick and concrete, 3-story, 102 x 352-foot factory, a brick, concrete and steel, 1-story, 80 x 228-foot crane shed and a 490-foot overhead bridge.

DANBURY, CONN.—E. W. Mellor, architect, New Haven, Conn., is taking bids on a round house and repair shops, costing $65,000 for the New York, New Haven & Hartford railroad. The structures will be one story high, 48 x 136 feet, with two 40 x 50-foot wings.

DANIELSON, CONN. — The Connecticut Mills Co. has awarded a contract for a brick, 4-story addition to connect its two mills at a cost of $75,000.

EAST HARTFORD, CONN.—Olds & Whipple will build a brick and steel, 1-story, 100 x 120-foot warehouse on Tolland street.

GREENWICH, CONN. — The New York, New Haven & Hartford railroad is building an interlocking signal plant to cost $40,000 east of its Greenwich station. It will build a larger bridge over the Mystic river in Mystic, Conn.

HARTFORD, CONN. — Bids close about Oct. 15 for a brick and stone, 5-story, 100 x 180-foot building to cost $300,000 for the Y. W. C. A. at Church and Ann streets.

MIDDLETOWN, CONN.—The Russell Mfg. Co. has awarded a contract for a reinforced concrete, mill-construction, 2-story, 144 x 144-foot addition to its plant at South Farms to cost $40,000.

NEW BRITAIN, CONN.—The Barnes & Cobert Co. will build a brick, mill-construction, 1-story, 60 x 200-foot forge shop and galvanizing building.

NEW HAVEN, CONN.—The Pennsylvania Seaboard Steel Corporation, Pittsburgh, has purchased the plant of the National Steel Foundry Co. on Wheeler street and will start at once to manufacture ingots for munitions plants.

STAMFORD, CONN. — Plans have been completed by the Braer Bros., manufacturers of bronze and aluminum powders, for another addition to their plant costing $10,000.

STAMFORD, CONN.—The Stamford Gas & Electric Co. will build a 60 x 150-foot office building to cost $25,000 at Atlantic and Federal streets.

WATERBURY, CONN.—The Chase Rolling Mill Co. and the Chase Metal Works will build an office building at Grand and Leavenworth streets.

WATERBURY, CONN. — The Waterbury Brass & Bronze Co., manufacturer of brass and bronze castings, has purchased a 107 x 174-foot tract for the erection of an addition to its plant.

WATERBURY, CONN. — The Waterbury Mfg. Co. has awarded a contract for a factory building to the Torrington Building Co. The new plant will be 104 x 200 feet, six stories and of brick and steel construction.

WATERBURY, CONN. — The Waterbury Farrel Foundry & Machine Co. has awarded a contract for a brick and stone, mill-construction, 6-story, 104 x 200-foot factory on North Main street.

WINDSOR, CONN.—The General Electric Co. has awarded a contract for a 3-story, 30 x 30-foot addition to its plant.

From the Alleghenies to the Sea

ALBANY, N. Y.—E. V. Stratton Motors Co. has been incorporated to manufacture motors, trucks, etc., with $51,000 capital. The incorporators are E. V. Stratton, G. D. Hills and J. S. Pettit.

BROOKLYN, N. Y.—The Adriance Machine Works, 254 Van Buren street, will start work at once on the erection of a 6-story, reinforced concrete, 100 x 200-foot machine shop to cost $180,000.

BUFFALO.—G. Morton Wolfe, architect and engineer, 1377 Main street, is ready for bids on the $75,000 plant of the Rice & Adams Dairy Machinery Co.

NEW YORK.—The Lee Jacobs American Bronze Novelty Works, Inc., has been incorporated with $30,000 capital by M. Kohn, J. Schalabrino, L. Jacobs, 385 West Central park.

NEW YORK.—The American Steam Conveyor Corporation has been incorporated with $55,000 capital by S. A. Anderson, S. B. Howard and A. W. Britton, 28 Nassau street.

NEW YORK.—The Wright-Martin Aircraft Corporation has been incorporated to manufacture aeroplanes, motors, machinery, etc., with $7,500,000 capital. The incorporators are T. S. Buckingham, S. St. Dodd and G. F. Jebbett, 265 West 122d street.

NIAGARA FALLS, N. Y.—Titanium Alloy Mfg. Co., care A. Thompson, is ready for bids on a $7,000, 1 and 2-story power house, 46 x 53 feet.

SYRACUSE, N. Y.—The general contract for a $7,000 power house for Hotaling, Warner Co. has been let to Dawson Bros.

TROY, N. Y.—The Interstate Machine Co. is taking bids on the general contract for a $6,000, 2-story factory, 33 x 60 feet.

TROY, N. Y.—Plans are being prepared for a $1,500,000, 8-story addition to the plant of Cluett, Peabody Co. Westinghouse, Church, Kerr & Co., 37 Wall street, New York, are the builders.

BARTLEY, N. J.—William A. Bartley & Sons, whose works were recently burned, announce that they will rebuild the plant.

CAMDEN, N. J.—The Southwark Mfg. Co. plans the erection of a $20,000 plant addition. The architects are Moffett & Steward, Camden.

DOVER, N. J.—The board of education is having plans prepared for a new high school to cost $147,000.

DOVER, N. J. — The Downs & Slater Foundry Co. are asking for bids on the construction of a foundry building. The plans are on file at the office of the Dover board of trade.

FLEMINGTON, N. J. — Flemington Cut Glass Co. will build an addition, 35 x 56 feet.

GLASSBORO, N. J.—The Whitney Glass Works has let a contract to the James Stewart Co. for brick, steel and concrete buildings, 1-story, 254 x 410 feet; 95 x 222 feet, and 68 x 186 feet, respectively.

GLOUCESTER CITY, N. J.—The Rogers Construction Co. has been incorporated to manufacture and deal in aeroplanes, aircraft, hydro-aeroplanes, automobiles, vehicles and boats. The new company is capitalized at $100,000, by Francis C. Rogers, Arabella Rogers, Camden, N. J., and John M. Hamor, Gloucester City.

HOPEWELL, N. J.—The borough of Hopewell will install a sewer system and build a sewage disposal plant.

NEWARK, N. J.—Improvements will be made at the Overbrook hospital to cost $205,000. The work will include three additions to the laundry, new machinery and sewage disposal plant.

NEWARK, N. J.—The Selah Mfg. Co. has been incorporated to manufacture and deal in clamping brackets. The new company is capitalized at $125,000, by John J. Sloat, Edward A. Schilling and Michael J. A. Doyle, Newark.

SOUTH RIVER, N. J.—The city of South River contemplates installing a new 300-horsepower gas unit to cost about $50,000.

CORRY, PA.—The Standard Screw Co. has been incorporated with $20,000 capital by S. V. Stewart, F. N. Ames, L. T. McElroy, Corry, L. R. and C. F. Bliss.

PHILADELPHIA.—The L. & H. Clutch Co. has been incorporated with $25,000 capital. Milton N. Heilberger, 3807 Chester avenue, is treasurer.

PHILADELPHIA.—The Anderson Mfg. Co. has been incorporated to manufacture heating appliances with $10,000 capital. J. Scott Fowler, 39 Laurel street, is treasurer of the new company.

PHILADELPHIA, PA.—The Hogg Construction Co. is estimating on plans for alterations and additions to the foundry of the Bernstein Mfg. Co. at Third street and Allegheny avenue, Philadelphia.

PITTSBURGH. — The Keystone Seamless Tube Co. has been incorporated with $10,000 capital by A. M. Thompson, Gibsonia, Pa., H. Stewart, Pittsburgh, and Roy Rose, Sewickley, Pa.

SLATINGTON, PA.—The Iron Products Co., William Leib, Pottsville, Pa., president, has purchased the Slatington Rolling Mills and will double its capacity.

SWISSVALE, PA.—The Vesuvius Crucible Co. has been incorporated to manufacture steel with $5,000 capital by James Miller, Glen Osborne, James R. Dunn and John Herron, Pittsburgh.

TIDICUTE, PA.—The Baldwin Cutlery Co. has been incorporated with $15,000 capital by Ellis S. Kennedy, H. D. Baldwin, Tidicute, and H. S. Keck, Warren, Pa.

WASHINGTON, D. C.—Work will be started shortly on a $30,000, 1-story factory, 100 x 100 feet, for the Anderson Pneumatic Tire & Spring Co. The Austin Co., 26 South Fifteenth street, Philadelphia, is the architect and builder.

Activities in the Central States

AKRON, O.—According to John W. Demead, one of the incorporators of the Demead Rubber Co., the company will erect a $50,000 factory on Britton road, where the company will manufacture heels and soles.

ALLIANCE, O.—The Welding plant of the Transue & Williams Co., destroyed by fire, will be rebuilt.

ALLIANCE, O.—Chester & Flemming, engineers, Pittsburgh, are preparing plans for rebuilding the city pumping station, a concrete reservoir and other buildings. A bond issue for $150,000 has been sold for the project.

BUCYRUS, O.—A contract for the erection of a new power plant for the Bucyrus Electric Light & Power Co. has been awarded to George Hicks, South Charleston, O. The structure will be of brick and steel and will cost $15,000. A boiler is included in the equipment to be installed.

CINCINNATI.—The building occupied by the Citizens' National bank at Madison and Pike streets will be razed and a 3-story, reinforced concrete structure to cost $100,000 will be erected. J. J. Craig has the contract for the work.

CLEVELAND.—The directors of the Cleveland & Sandusky Brewing Co., American Trust building, have voted to spend $100,000 for new machinery.

CLEVELAND.—The White Co. has taken out a permit for the erection of a 1-story, steel and concrete, 241 x 304-foot addition to its automobile plant. The total expenditure contemplated is about $200,000.

CLEVELAND.—Ernest McGeorge, Leader-News building, has completed plans for a factory addition to the plant of the Falls River Machine Co., Kent, O. The cost of the structure will be $25,000.

CLEVELAND.—W. C. Owen & Co., engineers, Leader-News building, are preparing plans for a plant for the Westwood Tire & Rubber Co., of which A. L. Westwood, 50 Broad street, New York City, is president. The plant will consist of a factory building, 200 x 240 feet, and a power plant, 40 x 60 feet. The plant will cost $200,000 and will be located at Warren, O.

DAYTON.—Schenk & Williams, architects, are ready for bids on a factory addition to the plant of the Remy Electric Co., Anderson, Ind. The building will be two stories and basement, 50 x 240 feet, and will cost $30,000.

DAYTON, O.—R. C. Paul of the Morgan Engineering Co., announces that bids will be opened about Oct. 1 for the construction of a river dam in the Great Miami river. The dam will be 600 feet long, of reinforced concrete construction and will cost about $40,000.

FINDLAY, O.—McLaughlin & Hulskin, architects, 610 Savings building, Lima, O., are ready for bids on the erection of a factory building in Findlay for A. J. Hull. The cost will be $40,000.

GENEVA, O.—According to T. H. Russel of the American Fork & Hoe Co., the company will increase its plant by the erection of a brick building, 60 x 400 feet, and a forge room, 42 x 109 feet.

LORAIN, O.—Contracts will be awarded soon for the erection of a 2-story and basement storage house for the National Stove Co. Elevators will be installed.

Business Changes, Consolidations and Expansions

The foundry business of O. V. Hooker & Sons, St. Johnsbury, Vt., has been sold to Louis M. Smythe, Alexander Dunnet and Perley F. Hazen, who will incorporate.

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The Hartford Motor Parts Co., Hartford, Conn., has changed its style to the Connecticut Auto Parts Co.

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The United Smelting & Aluminum Co., New Haven, Conn., has announced the opening of its new rolling mills at New Haven for turning out aluminum sheets, coils, etc.

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The Pettingell Machine Co., Framingham, Mass., has acquired the plant formerly occupied by the Standard Woven Fabric Co.

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The Brunswick Marine Construction Corporation, Brunswick, Ga., has acquired the plant of the Parker-Hensel Engineering Co., consisting of a large marine repair shop, a machine shop and a foundry.

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The McVay-Walker Co., Pittsburgh, has purchased a site for future extensions from John Kirschner.

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The style of the Youngstown & Southern Railroad Co., operating in Ohio between Youngstown and Leetonia, has been changed to the Youngstown Suburban Co.

* * *

The White Motor Co., Cleveland, formed by the reorganization of the White Co., Cleveland, received the title of the property of the old company recently.

* * *

The Pollak Steel Co., Cincinnati, has taken over the plant of the Willard Sons & Bell Co., Chicago.

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The Ohio Blower Co., Cleveland, has purchased a building site between West Ninety-first and Ninety-third streets along the Nickel Plate railroad.

* * *

The M. & D. Mfg. Co., Youngstown, O., recently incorporated, has purchased the plant of the Ohio Sash Weight Co., at Youngstown.

* * *

The Cohen-Schwartz Rail & Steel Co., St. Louis, has opened a branch office in the Oliver building, Pittsburgh, in charge of S. W. Platt, formerly manager of the same office for the Canton Iron & Metal Co. The St. Louis company is at present equipping its new yards in St. Louis.

The Eagle-Pitcher Lead Co., an Ohio corporation with offices at Cincinnati, has been incorporated to conduct its business in Illinois.

* * *

The John Dotsch Sheet Metal Works, 412 Grand avenue, Menominee, Mich., has sold its plant and business to the Square People's House Furnishing Co., which will specialize in furnace and stove work.

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The Grand Rapids Brass Co., Belding, Mich., has added a new department for the manufacture of wire shelving for refrigerators.

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The J. I. Case Plow Co., Racine Wis., has purchased a 120 x 120-foot site at Mead and Water streets to be used for future extensions.

* * *

The Falls Motors Corporation, Sheboygan Falls, Wis., has leased the former office of the company in the building of the Brickner Woolen Mills Co. and will equip it for use as a foundry and machine shop.

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The Lyons Boiler Works, De Pere, Wis., after being idle for a year, will resume operations in connection with the Joliet Bridge & Iron Co., of Joliet, Ill., with which a consolidation has been effected.

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J. D. Morris, superintendent of the Northwest Harvester Co., and Wilbur A. Toner are planning to reopen the harvester plant of the Gilbert Hunt Co. at Walla Walla, Wash. They will incorporate with a capital stock of $100,000.

* * *

The Saskatchewan Steel & Bridge Co., with plants at Moose Jaw, Sas., and Medicine Hat, Alta., is now looking for a site in New Westminster, B. C., for establishing a plant.

* * *

The new gray iron foundry of the Sterling Machine & Stamping Co., Wellington, O., will be in operation early in October and is now booking orders for light and gray iron castings on which they can give prompt delivery. This plant will have capacity of 6 to 8 tons daily and is the first unit of what eventually will be a large gray iron foundry. It is 60 x 120 feet, of concrete construction. In addition, this company also has an aluminum foundry making kitchen ware, as well as castings of all kinds.

LORAIN, O.—The Black River Telephone Co. will spend $150,000 in improvements to its telephone system. A new exchange building, two stories, to be built at a cost of $35,000, is included in the project.

LORAIN, O.—The Pennsylvania railroad, which recently acquired control of the Lorain, Ashland & Southern railroad, will make extensive improvements in Lorain. Plans are now being prepared for a roundhouse, machine shops and a repair yard.

LONDON, O.—The board of public affairs has been authorized to engage an electrical and a mechanical engineer to superintend the rebuilding of the London electric lighting plant for which project $25,000 in bonds will be issued.

MASSILLON, O.—Work has started on the erection of a new office building for the Massillon Rolling Mill Co. The building will be erected on Columbia heights at a cost of $20,000. A. F. Wendling of Canton, has the contract.

TOLEDO, O.—Sidney Aftel, architect, has awarded a contract for the erection of a 2-story, 40 x 120-foot warehouse for A. Midel.

TOLEDO, O.—Devore & Gormely, 304 Nashby building, will take bids soon for the erection of a 1-story, 100 x 400-foot foundry building for the G. & O. Foundry Co., Sandusky, O.

TOLEDO, O.—The Woodville Lime & Cement Co. has increased its capital from $300,000 to $400,000 and will purchase machinery including a stone crusher and a machine for manufacturing stucco.

WELLINGTON, O.—The Sterling Co. will build a 60 x 120-foot foundry building near the Wheeling & Lake Erie railroad tracks.

YOUNGSTOWN, O.—The Packard Electric Co. has had plans prepared for a 3-story, 64 x 140-foot, brick building to be erected at a cost of $65,000.

YOUNGSTOWN, O.—The D. & M. Mfg. Co., Cleveland, recently incorporated with $75,000 capital, has purchased the plant of the Ohio Sash Weight & Foundry Co., near Moiser, O., and will erect a 40 x 100-foot building.

WIERTON, W. VA.—According to J. Edwards Collins, engineer for the Phillips Sheet & Tin Plate Co., work will be started soon on the erection of a $200,000 addition to the sheet mill.

EVANSVILLE, IND.—The Schlundt Motor Co. has been incorporated with a capitalization of $25,000, to manufacture motor cars. The directors are Jabez Wolley, C. A. Reitz and A. J. Schlundt.

FORT WAYNE, IND.—The O. K. Machine Co. has incorporated with a capitalization of $10,000, to operate machine shop and to manufacture tools. The directors are Nestor Fries, L. J. Johnson and G. W. Fries.

HAGERSTOWN, IND.—The Teetor-Martley Motor Car Co. is building a 2-story addition, 32 x 135 feet, to cost $22,000.

HAMMOND, IND.—The National Surface Guard Co. will build a machine shop costing $5,000. A. C. Berry, Ruff building, is the architect.

INDIANAPOLIS.—The Universal Tool & Die Co. has been incorporated to conduct the business of a foundry and machine shop with $10,000 capital, by Durward River, Edward W. Holt and Charles J. McHugh.

INDIANAPOLIS, IND. — The Standard Electric Mfg. Co. has been incorporated with a capitalization of $100,000, to manufacture electrical devices. The directors are Earl C. Applegate, David A. Frew and B. Frank Hall.

INDIANAPOLIS.—The International Steam Control Co. has been incorporated with $25,000 capital, to manufacture a steam control device, by Cole Stickle, William Lightford and Henry Langsenkamp.

KOKOMO. — The Superior Machine Tool Co. has increased its capital stock from $180,000 to $360,000.

KOKOMO, IND. — The Kokomo Brass Works will build a gray iron foundry, 120 x 250 feet, to cost $30,000. Frank D. Chase, 122 South Michigan avenue, Chicago, is the architect.

MISHAWAKA, IND.—Rudolph Kamm is considering plans for the erection of a large plant to manufacture a newly invented irrigation pump which has a capacity of 1,000 gallons a minute. The plant also would do a general machine shop business.

SOUTH BEND, IND.—The Studebaker Corporation has awarded contracts to James Stewart & Co., New York and Chicago, for the erection of a foundry and machine shop to cost $1,500,000. The machine shop will be 300 x 900 feet and the foundry will be 150 x 1,100 feet, and will have a daily capacity of 250 tons.

CHICAGO.—O. Baun, Kedzie and Thirty-first street, will build a 1-story foundry, 40 x 200 feet, costing $10,000.

CHICAGO.—The Chicago, West Pullman & Southern railroad is planning to build shops. H. P. Utley, 606 South Michigan avenue, is the purchasing agent.

CHICAGO.—The Krebs Mfg. Co., 341 East Ohio street, has been organized by C. E. Krebs and others, and will manufacture dies and tools.

CHICAGO. — A. Bauer, 233 West Huron street, will build a 4-story garage, costing $50,000. L. A. Weary, 64 East Randolph street, is the architect.

CHICAGO.—The Orkney Springs Co. has been organized with $500,000 capital, by Charles C. Cirese, J. F. Reev and James E. McGrath, 69 West Washington street.

CHICAGO. — The Packers' Machinery & Equipment Co. has been incorporated to manufacture machinery with $10,000 capital, by Eugene R. Cohen, James Glassner and Bessie Swick.

CHICAGO.—The Allbright-Neil Co., 4023 Wentworth avenue, has let a contract for a plant at Fifty-third and Western avenue to cost $90,000, three stories, 141 x 232 feet, for the manufacture of packing house machinery.

CHICAGO. — The Chicago, Burlington & Quincy railroad has plans nearly ready for two freight terminal buildings, each 65 x 800 feet, three stories, of brick, steel and reinforced concrete, on which bids will be asked about Dec. 1. T. E. Calvert, 547 West Jackson boulevard, is the chief engineer.

GENESEO, ILL.—Bonds for $48,000 have been voted for a municipal election light plant. B. S. Gray is the city attorney.

GOLCONDA, ILL.—The Golconda Portland Cement Co. is planning to build a plant costing $1,000,000. W. A. Calhoun, Paducah, Ky., is the engineer.

HARVEY, ILL.—The S. Ward Hamilton Co., Chicago, is building a factory at Harvey, for the manufacture of steel specialties.

KANKAKEE, ILL.—The Bradley Foundry Co. has been incorporated with $5,000 capital, by J. F. Cady, F. H. Seidel and O. Gommell.

PEKIN, ILL.—The city of Pekin is planning to build a bridge across the Illinois river to cost about $100,000.

ROCKFORD, ILL.—The Waisner Mfg. Co. has been incorporated to manufacture furnaces with $5,000 capital by C. E. Swenson, H. W. Waisner and E. C. Kraner.

ALMA, MICH.—Bonds for $100,000 have been voted for waterworks extensions and a pumping station. P. E. Gallagher is the city clerk.

BENTON HARBOR, MICH.—Bids will be received until Oct. 22, by Harry Smith, city clerk, for a steel viaduct, 180 feet long with

BENTON HARBOR, MICH.—The Chicago Stove & Range Co., Fulton, Ill., will build a plant at Benton Harbor.

BENTON HARBOR, MICH.—The Baker Vawter Co., manufacturer of metal files and furniture, will build a 2-story factory, 60 x 200 feet.

DETROIT.—The Vinton Steel Process Co., 751 Bellevue avenue, will build a 3-story addition, 40 x 70 feet.

DETROIT.—The Michigan Central Railway Co. will build a bridge and viaduct costing $45,000.

DETROIT.—I. Kaplan, 119 Illinois street, will build a foundry, 40 x 105 feet, to cost $7,000.

DETROIT.—The Auto Traffic Signal Co. will build a factory for manufacturing a traffic signal. W. C. Jewell is the general manager.

DETROIT.—The New Era Spring & Specialty Co. has been incorporated with $50,000 capital, by E. B. Fulmer, W. B. Blood and William S. Daniels, 864 Woodward avenue.

DETROIT.—The International Metal Stamping Co. has been incorporated with $300,000 capital by F. J. Fisher and O. L. Currier, 146 Philadelphia avenue.

DETROIT.—The American Ball Valve & Mfg. Co. has been incorporated to conduct the business of a foundry and machine shop. The new company is capitalized at $50,000 by Arno and Herman A. Miller and Carl E. Reichle.

GRAND HAVEN, MICH.—The city of Grand Haven is planning to install a 200,000-gallon pump and a 3-mile transmission line in connection with its electric light plant. C. R. Ellison is the city manager.

GRAND RAPIDS, MICH.—J. A. Anderson is promoting a $250,000 company to build a factory to manufacture a 4-cycle, valveless motor.

HOWELL, MICH.—The Howell Electric Motors Co., which recently increased its capital stock from $30,000 to $100,000, will be a brass foundry to do its own casting, which has been formerly done under contract. The company is also adding equipment to its machine shop.

KALAMAZOO, MICH.—The Barrow Spring Co., W. W. Gregg, manager, will build an addition to its plant.

KALAMAZOO, MICH. — The Kalamazoo Malleable Iron Co. has been incorporated with $125,000 capital, by W. S. Dewing, D. L. Curtenius and George S. Burdeen.

MONROE, MICH.—The plant of the National Silica Co. was damaged by fire with a loss of $100,000. The plant will probably be rebuilt and new machinery installed.

MUSKEGON HEIGHTS, MICH. — The Standard Malleable Iron Works has increased its capital stock from $100,000 to $250,000, and will build additions to its plant.

PONTIAC, MICH.—O. J. Beaudette, manufacturer of automobile bodies, will build a 1-story factory, 60 x 150 feet, to cost $7,000.

APPLETON, WIS.—The Northern Boiler & Structural Iron Works is planning to build a new plant to provide further manufacturing capacity.

FOND DU LAC, WIS.—The Damrow Bros. Co., manufacturers of sheet metal specialties, will build a 2-story factory, 100 x 200 feet.

New Trade Publications

MOTORS.—Induction motors for two or three-phase alternating current are illustrated and described in a 52-page catalog issued by the Lincoln Electric Co., Cleveland. The unique rotor construction of this motor is described in detail and the installation of the stator between phases also is considered. Motors for elevators and hoists, pump motors, etc., are shown and many views of applications of this line of motors are included. One section shows the installation of this line of motors in metal-working plants. The arc welders built by this company also are briefly considered.

CARRYING DEVICES.—The New Jersey Foundry & Machine Co., 90 West street, New York, has published a 48-page catalog in which considerable technical data on the subject of trolleys, tracks, hoists, cranes, buckets, and cars, are given. For each type of machine a table of specifications is included. The value of such a publication is evident, since it places information in prospective purchasers' hands without the usual procedure of writing for additional catalogs. This bulletin is profusely illustrated showing the different machines manufactured by this company as well as views of numerous plants where installations have been made.

MULTIPLE FANS.—A 24-page catalog has been issued by the Clarage Fan Co., Kalamazoo, Mich., which illustrates and describes its line of multiblade fans adapted for heating or ventilating installations in factories, mines, tunnels, public buildings, etc.; furnishing blast for cupolas, and various other applications. A large number of capacity tables are included, which are made up from actual performance tests. These are guaranteed to be correct for standard conditions with air at 70 degrees Fahr. and barometric pressure at 29.92 inches. Dimension tables also are included. Exhaust fans, speed exhausters, volume blowers, pressure blowers, etc., also are illustrated and described.

COMPRESSORS.—The Chicago Pneumatic Tool Co., Chicago has recently issued a bulletin describing its single-stage steam and power driven air compressor. Compressed air has been adapted to so many uses within the last few years that the service required of compressors is unusually exacting. To further emphasize its contention that simplicity in compressor construction is vital, considerable space is devoted in this bulletin to detailed drawings of the various types of compressors which are built by the Chicago Pneumatic Tool Co. Tables and charts of specifications for each style machine are embodied in this catalog in conjunction with a number of illustrations showing details of construction.

FLEXIBLE SHAFTING, ELECTRIC TOOLS, MOTORS.—Three bulletins devoted respectively to flexible shafting, electric tools and electric motors have been issued by the Stow Mfg. Co., Binghamton, N. Y. The bulletin devoted to flexible shafting contains 58 pages and illustrates and describes this equipment in detail and shows its many applications in industrial plants. The bulletin devoted to electric tools, describes electrically driven drills, buffers and grinders, screw drivers, post grinders, bench and floor grinders, etc. The electric motor bulletin contains 20 pages and shows a 4-pole multi-speed motor of the stationary type, by-polar multi-speed motor, small power motors, etc., built by this company.

HOISTS AND TROLLEYS.—The Euclid Crane & Hoist Co., Euclid, O., has issued a carefully prepared catalog describing its electric hoists, monorail trolleys, electric traveling cranes, wall cranes, jib cranes and hand operated cranes. The cranes and hoists are built to operate efficiently and economically in all sorts of industrial plants and under a variety of different conditions. The machines are built in stock sizes and design, but special cranes and hoists are made for points of unusual application. The booklet contains a number of illustrations showing the different hoists and cranes, which are said to be of rugged and simple design. Other illustrations show factories, warehouses and similar places where the machines have been installed and find many practical uses.

WATER SCREENS.—The Chain Belt Co., Milwaukee, has ready for distribution a bulletin which describes its traveling water screens. The chain belt screens are designed to remove foreign material or refuse from water which is to be used in steam boilers or for industrial purposes where there is a demand for a continuous supply of clean water. The screens may also be used to remove by-products from water leaving manufacturing plants, either for reclamation or to avoid contamination of water ways. It is said the screen or battery of screens may be installed in any position and may be operated with a small motor. Material left on the screen after the water has passed through is automatically washed from the screen into a receiving trough.

FOUNDRY EQUIPMENT.—Three catalogs issued by the Whiting Foundry Equipment Co., Harvey, Ill., are devoted respectively to tumbling mills and dust arresters, core ovens and ladles. The line of tumbling barrels built by this company is well known to the foundry trade and the catalog contains many details of the construction of these mills, as well as views of several recent large battery installations. A water cinder mill also is described, as well as dust arresters and exhaust systems for tumbling mill. The core oven catalog illustrates and describes this company's standard drawer and car types. A machine for withdrawing cars from ovens also is shown, as well as coremakers' benches, core-oven cars and trucks. Ladles of every conceivable type for pouring castings are shown in the 24-page catalog devoted to this equipment.

CRANES, HOISTS AND CUPOLAS.—The Northern Engineering Works, Detroit, manufacturers of foundry equipment, has issued three catalogs devoted respectively, to cranes, electric hoists and the Newten cupola. The crane catalog, which consists of 64 pages, illustrates and briefly describes the extensive line of traveling cranes built by this company and numerous service views are included showing the installation and operation of these cranes in various industrial establishments. The electric hoist catalog, which consists of 20 pages, shows portable hoists with both plain and enclosed controlers, trolley hoists, cab type hoists, mono-rail trolley hoists, trolleys, etc. The cupola catalog describes Newten furnaces in detail and shows numerous installations as well as equipment accessories for the foundry, such as ladles, core oven cars, tumbling barrels, foundry elevators, air hoists, etc.

SMOOTH-ON INSTRUCTION BOOK.—An instruction book detailing the uses of the products manufactured by the Smooth-On Mfg. Co., Jersey City, N. J., and containing 144 pages, recently has been issued. The iron compounds are intended for repairing leaks or breaks in castings and for making connections in steam or hydraulic work. One of these compounds is quick hardening while the other is slow hardening. Another iron cement is adapted for repairing blemishes, blow-holes or other defects in iron or steel castings and is made in two forms. In addition, various cements are manufactured for iron caulking, for making tight joints in structural iron or steel work, for weather-proofing, dust-proofing, oil-proofing, gasoline-proofing and hardening concrete. Another cement adapted for setting or coating fire brick is a combination of iron cement and heat-resisting fire clay. This instruction booklet should prove of value to all operators of industrial plants since these cements and compounds have wide industrial application.

STEAM HAMMERS.—The Buffalo Foundry & Machine Co., Buffalo, N. Y., has issued an unusually attractive catalog describing its line of steam hammers. According to the brief history appearing on one of the introductory pages, the type of hammer now made by this company was first put on the market by the David Bell Engineering Works in 1868. Since then the design has been changed and improved, and recently the original builders were consolidated with the present manufacturers, combining the engineering experience of the former with the manufacturing facilities of the latter. As is the custom in classifying all steam hammers, the Bell hammers are rated in size according to the actual scale weight of the falling part. The design is said to provide a liberal factor of safety, and to permit efficient operation. The frames of all Bell hammers are of a shock resisting type of cast iron, with the exception of the columns or double frames of combined and drop hammers, which are made of open-hearth steel. The columns of single frame standard guide hammers and open frame hammers are cast solid with the bed plate. The cylinders and piston valve and throttle valve chests are cast in one piece. The valve motion is said to be simple and is so arranged that the movement of the piston is under sensitive control at all times. The hammer heads are open-hearth steel forgings and the piston rod and head is made from a single forging of open-hearth steel or heat treated and annealed alloy steel. The guides are made from a special grade of cast iron and are cast on end. The hammer is lubricated by means of an automatic force feed oil pump operated from moving parts of the hammer. Illustrations of a large variety of single and double frame hammers ranging in size from 100 to 6,000 pounds, trimming presses, motor-driven forging hammers, and single purpose hammers are presented in the catalog. Several pages are devoted to drawings which show special points of construction, and suggestions for the design and installation of foundations, with accompanying sketches, are given. Mention is made of the facilities at the disposal of the company for furnishing repair parts and for assisting users of steam hammers in solving engineering problems incident to the installation of forging equipment.

IRON AND STEEL PRICES

Corrected up to Tuesday noon

PIG IRON

(Lower price to Jan. 1, 1917; higher to July 1, 1917.)

Bessemer valley	$22.00
Bessemer, Pittsburgh	22.95
Basic, Pittsburgh	19.45 to 19.95
Basic, eastern Pa.	20.00 to 20.50
Basic, Buffalo	19.00 to 19.50
Malleable, Pittsburgh	19.70 to 19.95
Malleable foundry, Chicago	19.00 to 19.50
Malleable foundry, Philadelphia	21.00 to 21.50
Malleable foundry, Buffalo	19.00
No. 1X foundry, Philadelphia	20.25 to 20.50
No. 2 foundry, Pittsburgh	19.70 to 19.95
No. 2 foundry, Cleveland	19.00
No. 2 foundry, Ironton	18.50 to 19.00
No. 2 foundry, Chicago	18.50 to 19.00
No. 2X foundry, Philadelphia	19.75 to 20.25
No. 2X foundry, N. J. tidewater	20.00 to 20.25
No. 2X foundry, Buffalo	19.00
No. 2 plain, Philadelphia	19.50 to 19.75
No. 2 plain, N. J. tidewater	19.50 to 20.00
No. 2 plain, Buffalo	19.00
No. 2 southern, Birmingham	14.00 to 15.00
No. 2 southern, Cincinnati	17.40 to 17.90
No. 2 southern, Chicago	18.00 to 19.00
No. 2 southern, Phila. delivery	18.50 to 19.50
No. 2 southern, Cleveland	18.00 to 19.00
No. 2 southern, New York docks	18.50 to 19.00
No. 2 southern, Boston docks	18.75 to 19.25
No. 2 south. interior, New Eng.	19.50 to 20.50
No. 2 southern, St. Louis	18.40 to 18.90
Virginia No. 2X furnace	17.50
Virginia No. 2X, Philadelphia	19.75
Virginia, No. 2X, Jersey City	20.50
Virginia 2X, Boston points	20.75
Gray forge, eastern Pa.	18.50 to 19.00
Gray forge, Pittsburgh	19.20 to 19.45
Gray forge, Birmingham	13.50
Silveries, 8 per cent, furnace	21.00 to 27.00
Silveries, 8 per cent, Chicago	29.50
Low phos. Standard, Phila.	35.00 to 36.00
Low phos. Lebanon, Pa., furnace	29.00 to 31.00
Low phos. Pittsburgh	30.00 to 31.00
Charcoal, Lake Superior, Chgo., Nos. 1 to 4	19.75 to 22.25
Charcoal, Buffalo	21.00 to 22.00
Charcoal, Birmingham	22.50 to 23.00

IRON ORE

Lake Superior Ores.
(Lower Lake Ports.)

Old range Bessemer, 55 per cent, ton	4.45
Mesabi Bessemer, 55 per cent, ton	4.20
Old range non-Bess., 51½ per cent, ton	3.70
Mesabi non-Bess., 51½ per cent, ton	3.55

Eastern Ores.
(Per unit delivered eastern Pennsylvania.)

Pt. Henry fur., 60 per cent, unit	8.5c to 8.9c
Local N. Y. and N. J. ores, unit	8.5c to 8.75c
Port Henry lump, at mines, ton.	$4.00

Foreign Ores.
(Per unit Philadelphia.)

Foreign Bess., 50 to 65 per cent	nominal
For'n non-Bess., 50 to 65 per cent	nominal

COKE

(At the ovens.)

Connellsville furnace	$3.00
Connellsville fur., contract	2.75 to 3.00
Connellsville foundry, contract	3.25 to 3.50
Connellsville foundry	3.25 to 3.50
Wise county furnace, contract	3.00 to 3.25
Wise county foundry, contract	3.50 to 3.75
Pocahontas foundry, contract	3.25 to 3.75
Pocahontas furnace, contract	3.00 to 3.25
New River foundry, contract	3.75 to 4.25
New River furnace, contract	3.25 to 3.50

FERRO ALLOYS AND STEEL MAKING METALS

Ferro manganese, 80 per cent, seaboard, prompt	$164
Ferro manganese, 80 per cent, seaboard, contract	164
Spiegel, 20 per cent, fur. early and last half	45.00 to 50.00
Ferro-silicon, 50 per cent, Phil.	83.00 to 85.00
Ferro-silicon, 50 per cent, Pbgh.	83.00 to 85.00

Bessemer ferro-silicon, 9 per cent to 10 per cent, $30.00; 10 to 11 per cent, $31.00; 11 to 12 per cent, $32.00; 12 to 13 per cent, $33.00 a ton at the furnace at Ashland, Jackson and New Straitsville, O.

Ferro-carbon titanium, 8 to 12½ cents per pound in carloads.

SEMI-FINISHED MATERIAL

Open hearth billets, Phila	$48.00 to 50.00
Forging billets, Phila	65.00
Forging billets, Pbgh., nominal	65.00 to 70.00
Forging billets, Chicago	65.00
Wire rods, Pittsburgh (nom.)	55.00 to 60.00
Bessemer billets, Youngstown	45.00 to 50.00
Bessemer billets, Pittsburgh	45.00 to 50.00
Open hearth billets, Pittsburgh	45.00 to 50.00
Open hearth billets, Youngstown	45.00 to 50.00
Bess. sheet bars, Youngstown	45.00 to 50.00
Op. h'th sheet bars, Youngstown	45.00 to 50.00
Bess. sheet bars, Pittsburgh	45.00 to 50.00
Open hearth sheet bars, Pbgh.	45.00 to 50.00
Muck bars, Pittsburgh (nominal)	40.00 to 45.00

SKELP

Grooved steel skelp	2.60c
Sheared steel skelp	3.00c

RAILS AND TRACK MATERIAL

(Gross tons.)

Stand. Bess. rails, Pbgh. & Chg.	$33.00
Stan. op.-h'th rails, Pbg. & Chg.	35.00
Light rails, 8 to 10 lbs., Pbgh.	50.00
Light rails, 8 lb., Chicago	43.00
Light rails, 12 to 14 lbs., Pbgh.	49.00
Light rails, 12 lbs., Chicago	42.00
Light rails, 16 to 20 lbs., Pbgh.	48.00

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:—	
Cleveland	$0.95
Newark, N. J.	2.98
Boston	3.18
Philadelphia	2.78
Pittsburgh	.95
St. Louis	3.18
Buffalo to:—	
Albany, N. Y.	$1.26
New England (all rail)	2.58
New York and Brooklyn (all rail)	2.58
New York and Brooklyn (by canal)	1.25 to 1.60
Virginia furnaces to:—	
Boston docks (r. and w.)	$3.05
New England (all rail)	3.25
New York dock (r. and w.)	2.88
Birmingham, Ala., to:—	
Cincinnati	$2.90
Chicago	4.30
Cleveland	4.90
Louisville, Ky.	2.65
New York (all rail)	6.15
New York, (r. and w.)	4.25
Philadelphia (all rail)	5.20
Philadelphia (r. and w.)	4.00
Pittsburgh	4.90
Savannah, Ga.	2.75
Chicago to:—	
Des Moines	$2.80
Milwaukee	.50
Moline, Ill.	1.40
Omaha	3.58
St. Louis	1.58
Ironton and Jackson, O., to:—	
Chicago	$2.54
Cincinnati	1.26
Cleveland	1.62
Detroit	1.81
Indianapolis	1.58

Light rails, 16 to 20 lbs., Chgo.	$41.00
Light rails, 25 to 45 lbs., Pbgh.	47.00
Light rails, 25 to 45 lbs., Chgo.	40.00
Relaying rails, standard, Pbgh. and Chicago	$23.00 to 24.00
Relaying rails light, Chicago	24.00 to 25.00
Angle bars, st. sect., Pbgh. base	2.00c
Angle bars, st. sections, Chgo.	2.00c to 2.50c
Spikes, railroad, Pittsburgh	2.65c to 2.75c
Spikes, railroad, Chicago	2.75c to 2.90c
Track bolts, Pittsburgh	3.25c to 3.50c
Track bolts, Chicago	3.25c to 3.50c
Tie plates, Chicago	50.00 to 55.00

SHAPES, PLATES AND BARS

Structural shapes, Pbgh.	2.60c
Structural shapes, Philadelphia	2.759c to 2.909c
Structural shapes, Chgo.	2.79c to 3.50c
Structural shapes, New York	2.769c to 2.919c
Tank plates, Chgo.	3.19c to 3.60c
Tank plates, Pittsburgh (con.)	3.00c
Tank plates, Pittsburgh	3.25c to 4.00c
Tank plates, Philadelphia	3.159c to 4.159c
Tank plates, New York	3.169c to 4.169c
Bars, soft steel, Chicago	2.79c to 3.50c
Bars, soft steel, Pbgh.	2.60c
Bars, soft steel, New York	2.769c
Bars, soft steel, Philadelphia	2.759c
Hoops, carloads, Pittsburgh	3.00c
Bands, Pittsburgh	2.60c
Shafting, Pbgh., contr. carloads	15 to 20 off
Bar iron, Chgo.	2.35c
Bar iron, Philadelphia	2.559c to 2.659c
Bar iron, Cleveland	2.40c
Bar iron, New York	2.569c to 2.669c
Bar iron, Pittsburgh	2.65c to 2.75c
Hard steel bars, Chgo.	2.50c

SHEETS AND TIN PLATE

(Differentials indicated below are not now being closely followed.)

Bessemer
BLUE ANNEALED SHEETS PITTSBURGH

	Per lb.
Nos. 3 to 8	2.85c to 2.95c
Nos. 9 to 10 (base)	2.90c to 3.00c
Nos. 11 and 12	2.95c to 3.05c
Nos. 13 and 14	3.00c to 3.10c
Nos. 15 and 16	3.10c to 3.20c

Bessemer
BOX ANNEALED SHEETS, COLD ROLLED PITTSBURGH

Nos. 17 to 21	2.80c to 2.90c
Nos. 22 and 24	2.85c to 2.95c
Nos. 25 and 26	2.90c to 3.00c
No. 27	2.95c to 3.05c
No. 28 (base)	3.00c to 3.10c
No. 29	3.05c to 3.15c
No. 30	3.15c to 3.25c

Bessemer
GALVANIZED SHEETS OF BLACK SHEET GAGE, PITTSBURGH

Nos. 10 and 11	3.25c to 3.35c
No. 12	3.35c to 3.45c
Nos. 13 and 14	3.35c to 3.45c
Nos. 15 and 16	3.50c to 3.60c
Nos. 17 to 21	3.65c to 3.75c
Nos. 22 and 24	3.80c to 3.90c
Nos. 25 and 26	3.95c to 4.05c
No. 27	4.10c to 4.20c
No. 28 (base)	4.25c to 4.35c
No. 29	4.35c to 4.45c

No. 28, black, Chicago	3.19c to 3.29c
No. 28 galvanized, Chicago	4.59c
No. 10, blue annealed, Phila.	3.159c to 3.659c
No. 10, blue annealed, Chgo.	3.19c to 3.29c
Tin plate, 100 lb., coke base	$5.50 to 6.00

IRON AND STEEL PIPE

(Prices Adopted July 24, 1916.)

Steel.

Butt weld:—	Black.	Galv.
⅛, ¼ and ⅜ in.	62	35½
½ in.	66	51½
¾ to 3 in.	69	55½
Lap weld:—		
2 in.	63	50½
2½ to 6 in.	66	53½
7 to 12 in.	63	49½
13 and 14 in.	53½	..
15 in.	51	..

Iron.

Butt weld:—	Black.	Galv.
⅛ and ¼ in.	51	24
⅜ in.	52	25
½ in.	56	38
¾ to 1½ in.	59	43
Lap weld:—		
1¼ in.	46	31
1½ in.	52	38
2 in.	53	39
2½ to 4 in.	55	42
4½ to 6 in.	55	42
7 to 12 in.	54	41

BOILER TUBES

Steel, 3½ to 4½ inches, l. c. l.	54
Iron, 3½ to 4½ inches, l. c. l.	44

WIRE PRODUCTS

(Retailers' price 5 cents above jobbers' quotations.)

Wire nails, jobbers', Pittsburgh	$2.60
Plain wire jobbers', Pittsburgh	2.55
Galvanized wire, jobbers', Pbgh.	3.25
Polished staples, Pbgh.	2.75
Galvanized staples, Pbgh.	3.45
Barb wire, painted, jobbers' Pbgh.	2.75
Barb wire, galv., jobbers', Pbgh.	3.45

IRON AND STEEL PRICES

Corrected up to Tuesday noon

BOLTS AND NUTS

(Delivered within 20-cent freight radius.)

Carriage bolts, ½ x 6 inches, smaller or shorter, rolled thread, 50 and 5, cut threads, 40, 10 and 2½, larger or longer, 35 and 2½.

Machine bolts with hof pressed nuts ½ x 4 inches, smaller or shorter rolled 50, and 10; cut, 50; larger or longer, 40 and 5.

Cold pressed, semi-finished hexagon nuts, 60 and 5.

Gimlet and cone point lag bolts, 50 and 10. Hot pressed square, blank or tapped nuts, $2.70 off list; hot pressed hexagon blank or tapped, $2.70.

Cold pressed square, blank or tapped, $2.40 off; hexagon, blank or tapped, all sizes, $2.80.

RIVETS

Structural rivets, Pbgh	4.00c
Structural rivets, Chgo. delivery	4.00c
Boiler rivets, Pbgh	4.10c
Boiler rivets, Chgo. delivery	4.10c

Tinner's rivets, 45, 10 and 5 off, Pittsburgh.

STEEL SHEET PILING

(Pittsburgh.)

Base sizes	2.50c to 2.60c

STANDARD STEEL CHAIN

Chain, ⅜ inch proof coil	5.00c to 5.50c

COLD ROLLED STRIP STEEL

Base price 6.00c to 6.50c per 100 pounds, hard, coils 1¼ inches and wider and by .100 inch and heavier.

Extra for Thickness.

0.100-inch and thicker	Base
0.050 to 0.099	$0.05
0.036 to 0.049	0.20
0.035	0.20
0.031 to 0.034	0.35
0.026 to 0.030	0.45
0.020 to 0.024	0.55
0.025	0.45
0.017 to 0.019	1.35
0.015 to 0.016	1.75
0.013 to 0.014	2.45
0.012	2.80
0.011	3.15
0.010	3.50

Other extras as per card of March 13, 1916.

CAST IRON WATER PIPE

Four-inch, Chicago	$34.50 to 35.00
Six-inch and larger, Chicago	31.50 to 32.00
Six-inch Class B, New York	30.50 to 31.50
Four-inch Class B, New York	33.50 to 34.50
Four and six-inch Birmingham	28.00
Six-inch and larger, Birmingham	25.00

Leight weight water and gas pipe $1 per ton higher than standard water.

WAREHOUSE PRICES

Steel bars, Chicago	3.25c
Steel squares, 2-in. & ov., Cleve.	3.90c
Steel rounds, 2-in. & ov., Cleve.	3.90c
Steel bars, under 2 in., Cleveland	3.40c
Steel bars, Detroit	3.25c
Steel bars, Philadelphia	3.00c to 3.25c
Steel bars, New York	3.25c
Steel bars, St. Louis	3.30c
Steel bars, Cincinnati	3.35c to 3.90c
Steel bars, St. Paul	3.38c
Steel bars, over 2-in., Buffalo	4.20c
Steel bars, Buffalo	3.35c
Iron bars, Chicago	3.10c
Iron bars, Cleveland	3.35c
Iron bars, Detroit	3.20c to 3.25c
Iron bars, St. Louis	3.20c to 3.25c
Iron bars, Cincinnati	3.35c to 3.90c
Iron bars, Philadelphia	3.00c to 3.25c
Iron bars, New York	3.25c
Shapes, Chicago	3.25c
Shapes, Detroit	3.25c
Shapes, St. Louis	3.30c
Shapes, St. Paul	3.35c
Shapes, New York	3.25c
Shapes, Cleveland	3.40c
Shapes, Philadelphia	3.00c to 3.25c
Shapes, Buffalo	3.35c
Shapes and plates, Cincinnati	3.35c to 3.50c
Plates, Chicago	3.75c
Plates, Detroit	3.75c to 4.00c
Plates, St. Louis	3.80c
Plates, St. Paul	3.85c
Plates, New York	4.00c
Plates, Cleveland	3.80c
Plates, Philadelphia	4.00c to 4.25c
No. 10 blue anl. sheets, Chicago	3.40c
No. 10 blue anl. sheets, Cleve.	3.50c
No. 10 blue anl. sheets, Buffalo	3.25c
No. 10 blue anl. sheets, St. L.	3.45c
No. 10 blue anl. sheets, Cinci.	3.50c
No. 10 blue anl. sheets, St. Paul	3.50c
No. 10 blue anl. sheets, Detroit	3.55c
No. 28 black sheets, Chicago	3.35c
No. 28 black sheets, Cleveland	3.40c
No. 28 black sheets, Cincinnati	3.40c
No. 28 black sheets, Detroit	3.50c
No. 28 black sheets, St. Louis	3.40c
No. 28 black sheets, St. Paul	3.50c
No. 28 galv. sheets, Chicago	4.65c to 4.75c
No. 28 galv. sheets, Cleveland	4.40c to 4.75c
No. 28 galv. sheets, Cincinnati	4.50c to 5.00c
No. 28 galv. sheets, Detroit	5.00c
No. 28 galv. sheets, St. Louis	5.00c
Hoops, Cleveland	4.00c

Freight Rates, Coke

Connellsville district, per 2,000 lbs., to:—	
Baltimore	$1.80
Buffalo	1.85
Chicago	2.50
Cleveland	1.60
Detroit	2.10
East St. Louis	2.80
Joliet	2.50
Louisville	2.50
Milwaukee	2.85
New York	2.85
Philadelphia	2.05
Pittsburgh	.75
Richmond, Va.	2.94
Toledo	1.85
Valley Furnaces	1.20
Cincinnati	2.00

IRON AND STEEL SCRAP

(Net Tons.)

Angle bars, iron, Chicago	$20.00 to 20.50
Angle bars, steel, St. Louis	15.75 to 16.00
Arch bars and transoms, Chgo.	21.50 to 22.00
Arch bars and transoms, St. L.	22.50 to 23.00
Boiler plate, cut, No. 1, Chgo.	10.50 to 11.00
Boiler plate, cut, No. 1, St. L.	11.50 to 12.00
Boiler punchings, Chicago	13.50 to 14.00
Bundled sheet, Cincinnati	8.00 to 8.50
Busheling, No. 1, Chicago	14.00 to 14.50
Busheling No. 1, Cincinnati	10.50 to 11.00
Busheling, No. 1, Cleveland	13.25 to 13.50
Busheling, No. 1, St. Louis	14.25 to 14.75
Busheling, No. 2, Chicago	9.50 to 10.00
Cast borings Chicago	7.25 to 7.75
Cast borings, Cincinnati	5.00 to 5.50
Cast borings, Cleveland	6.50 to 6.75
Cast borings, St. Louis	8.25 to 8.50
Cast, No. 1, Chicago	12.75 to 13.25
Cast, No. 1, Cincinnati	12.00 to 12.50
Cast, No. 1, Cleveland	13.50 to 13.75
Cast, No. 1, St. Louis	13.00 to 13.50

Freight Rates, Finished Material

From Pittsburgh, carloads, per 100 lbs. to:—

New York	16.9 cents
Philadelphia	15.9 cents
Boston	18.9 cents
Buffalo	11.6 cents
Baltimore	15.4 cents
Cleveland	10.5 cents
Cincinnati	15.8 cents
Chicago	18.9 cents
Detroit	15.7 cents
Minneapolis and St. Paul	32.9 cents
Denver	83.6 cents
St. Louis	23.6 cents
New Orleans	30 cents
Birmingham	45 cents
Pacific coast (all rail)	73.9 cents
Pacific coast (tin plate)	70 cents
Pacific coast, via Panama canal	61.9 cents

Cut forge, Chicago	16.00 to 16.50
Iron axles, St. Louis	28.00 to 28.50
Iron axles, Cleve.	28.00 to 29.00
Knuckles, coup., Chicago	15.75 to 16.25
Knuckles, coup., St. Louis	16.25 to 16.75
Locomotive tires, Chicago	22.50 to 23.00
Locomotive tires, St. Louis	23.50 to 24.00
Machine shop turnings, Chgo.	6.00 to 6.50
Machine shop turnings, Cleve.	5.25 to 5.75
Machine shop turn'gs, Cincinnati	5.50 to 6.00
Machine shop turnings, St. L.	7.25 to 7.50
Malleable agricultural, Chgo.	11.00 to 11.50
Malleable agricultural, St. Louis	11.75 to 12.00
Malleable, Cincinnati	8.75 to 9.25
Malleable railroad, Chicago	12.00 to 12.50
Malleable railroad, St. Louis	12.75 to 13.00
Pipes and flues, Cleveland	12.00 to 12.50
Pipes and flues, Chgo.	12.00 to 12.50
Pipes and flues, St. Louis	13.00 to 13.50
Railroad wrought, No. 1, Chgo.	17.00 to 17.50
Railroad wrought, No. 1, Cleve.	16.25 to 16.50
Railroad wrought, No. 1, St. L.	18.00 to 18.50
Railroad wrought, No. 1, Cinci.	13.50 to 14.00
Railroad wrought, No. 2, Chgo.	16.00 to 16.50
Railroad wrought, No. 2, St. L.	17.00 to 17.50
Shafting, St. Louis	21.50 to 22.00
Springs, Chicago	16.00 to 16.50
Steel car axles, St. Louis	33.50 to 34.00
Steel car axles, Chicago	32.00 to 33.00
Stove plate, Chicago	9.25 to 9.75
Stove plate, Cleveland	10.00
Stove plate, Buffalo	11.00 to 11.50
Stove plate, Cincinnati	8.75 to 9.25
Stove plates, St. Louis	10.75 to 11.00

(Gross tons.)

Axle turnings, Cleveland	$11.25 to 11.50
Busheling, No. 1, Buffalo	13.00 to 13.50
Busheling, No. 1, Pittsburgh	13.50 to 14.00
Busheling No. 2, Buffalo	11.00 to 11.50
Bundled sheets, Pittsburgh	11.75 to 12.25
Bundled sheets, Cleveland	11.25 to 11.50
Bundled sheets, Buffalo	11.50 to 12.00
Car wheels, (iron), Pittsburgh	14.00 to 14.50
Car wheels (steel), Pittsburgh	18.25 to 19.00
Car wheels, Chicago	12.00 to 12.50
Car wheels, eastern Pa.	15.50 to 16.00
Car wheels, Buffalo	13.00 to 13.50
Car wheels, New York	13.50 to 13.75
Car wheels, St. Louis	13.00 to 13.25
Car wheels, Birmingham	10.50 to 11.00
Tram car wheels, B'ham	9.50 to 10.00
Cast borings, New York	7.50 to 8.00
Cast borings, eastern Pa.	9.50 to 10.00
Cast borings, Buffalo	7.50 to 7.75
Cast borings, Pittsburgh	8.50 to 9.00
Cast, No. 1, eastern Pa.	16.00 to 16.50
Cast, No. 1, Pittsburgh	14.75 to 15.00
Cast, No. 1, Birmingham	10.50 to 11.00
Cast, heavy No. 1, N. J. points	16.00 to 16.50
Forge, No. 1, eastern Pa.	12.00 to 12.50
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